

THE JOURNAL
OF THE
ANTHROPOLOGICAL INSTITUTE
OF
GREAT BRITAIN AND IRELAND.

APRIL 9TH, 1889.

Professor FLOWER, C.B., F.R.S., *Vice-President, in the Chair.*

The Minutes of the last meeting were read and signed.

The election of F. HAVERFIELD, Esq., M.A., of Lancing College, was announced.

The following presents were announced, and thanks voted to the respective donors:—

FOR THE LIBRARY.

From Messrs. TRÜBNER & Co.—Trübner's Record. No. 243.

From the AUTHOR.—Note on a case of Elephantiasis Arabum. By R. W. Felkin, M.D.

— The Nēgri Sēmbilan, their origin and constitution. By Martin Lister.

— Sul Cranio di un Idiota. By Michele Centonze.

— L'Ossio Bregmatico (Antiepilepticum); Studio di Michele Cnetonze.

— Tauromachia. By Giulio Barroil.

— Sagn og Fortællinger fra Angmagsalik, samlede af G. Holm.

VOL. XIX.

- From the AUTHOR.—*Ethnologisk Skizze af Angmagsalikerne af G. Holm.* 1887.
- From the ACADEMY.—*Bulletin International de l'Académie des Sciences de Cracovie. Comptes Rendus des Séances de l'année* 1889.
- From the ASSOCIATION.—*Proceedings of the Geologists' Association.* Vol. xi. No. 1. February, 1889.
- *Journal of the Royal Historical and Archæological Association of Ireland.* Vol. viii. Fourth Series. No. 77.
- From the ROYAL SCOTTISH GEOGRAPHICAL SOCIETY.—*The Scottish Geographical Magazine.* Vol. v. No. 4. April, 1889.
- From the SOCIETY.—*Proceedings of the Royal Society.* Vol. xlv. No. 277.
- *Proceedings of the Royal Geographical Society.* Vol. xi. No. 4. April, 1889.
- *Proceedings of the Society of Biblical Archæology.* Vol. xi. Part 5. March, 1889.
- *Proceedings of the Society of Antiquaries of Scotland.* 1887–88.
- *Journal of the Society of Arts.* Nos. 1897, 1898.
- From the EDITOR.—*Journal of Mental Science.* No. 113. April, 1889.
- *Nature.* Nos. 1013, 1014.
- *Science.* Nos. 317–321.
- *American Antiquarian.* Vol. xi. No. 2. March, 1889.
- *Revue Scientifique.* Tome xliii. Nos. 13, 14.
- *Revue d'Ethnographie.* Tome vii. No. 5. Septembre–Octobre, 1888.

EXHIBITION of the SKULLS of a BURMESE DACOIT
and of a REBEL CHINESE MANDARIN.

By CAPTAIN E. S. HASTINGS.

ONE of the skulls exhibited was that of Po Tok, a celebrated Burman Dacoit leader, who was a native of Nabuain, a village on the northern border of the Myniggan District, and close to the Ava district. He was the son of the Thugyi, or headman of the village. After his father lost his thugyi-ship, about 1882, Po Tok became a professional dacoit, and at the time of the annexation of Upper Burma, he was recognised as a daring leader. After giving great trouble to the military and police, he was shot in April, 1888. Po Tok was a man of considerably greater genius and audacity than most of his fellow-countrymen,

and he was universally feared for his inhumanity and rapacity. At the time of his death he was about thirty years of age.

The second skull exhibited by Captain Hastings, was that of a military mandarin, a native of one of the northern provinces of China. His real name was not known, but the name of Sze Chuen was given to him by the Burmese from the fact that the bulk of his followers in his last expedition were recruited in that province of Yunan. Sze Chuen had been of high military rank, and a Mandarin of the Blue Button, but was degraded and exiled to Yunan for unauthorized military enterprise. At the request of the Viceroy of Yunan he defended the Chinese merchants in Bhamo from attacks by the Kachins, but having quarrelled with these merchants, he threatened to sack the town. With a following of two hundred Chinamen from the province of Sze Chuen, and five hundred Kachins from the hills, he defended himself, and held Bhamo for a long time against the Burmese. After a siege of several months, during which Sze Chuen was distinguished by much bravery and moderation, he and his lieutenant, finding their position hopeless, disembowelled themselves in the Shind temple. The Burmese commander shot the corpse of Sze Chuen through the head, and then ordered it to be crucified. On the British occupation of Bhamo in December, 1885, Captain Hastings secured the skull. Sze Chuen was about forty years of age at the time of his suicide.

DISCUSSION.

Mr. WALHOUSE asked if Captain Hastings was aware of any superstition or beliefs, amongst the Burmese, of influence exercised after death by such characters as Po Tok. In Southern India notorious dacoits and robbers, as well as men of unusually wicked or violent character, who had made themselves feared in their neighbourhood, were believed after death, especially if it were violent or untimely, to become Bhutas (demons or malicious goblins), always intent on working mischief and bringing about misfortune. Sudden illnesses, death, diseases to cattle, blight of crops, and the like, are attributed to them. And in proportion as they were cruel and dreaded in life, by so much are they believed to become powerful and malignant when dead. Many years ago a gang of dacoits spread terror in the southern districts of Madras; the leader was especially ruthless, and when at last he was taken and executed, the popular fear of his Bhuta-malignity was such that for months after nearly half the children born in the region he ravaged were named after him, this being looked upon as a propitiation, and averting his evil influence from a house in which there was a child bearing his name. This belief in an evil influence after death seems somewhat analogous to the vampire superstition of Eastern Europe.

The Rev. W. D. MORRISON remarked, with reference to Captain Hastings' interesting account of the dacoit leader, whose skull he had exhibited, that as yet little or nothing had been done in England to test the accuracy of the contention that in most cases the skulls and physical structure of criminals constitute remarkable points of difference between them and the ordinary man. A school of anthropologists has recently arisen in Italy, which maintains that there is a distinctly criminal type of man who may be known from the normal man by certain definite physical characteristics. This criminal type is said to present anomalies in the structure of the skull, the eyes, the ears, the lower jaw, the arms, &c., and to occupy in the scale of life an intermediate position between the savage and the madman. Atavism and physical degeneracy are accounted the two leading features of this abnormal type. The chief advocate of these ideas is Professor Lombroso, of Turin, and in the last edition of his large work, *L'Uomo Delinquente*, he brings forward an immense number of facts and figures in support of his thesis. Not only in Italy, but also in France and Germany, Lombroso's conclusions have received a considerable amount of support, and a Congress devoted to criminal anthropology is to be held this year in Paris. The speaker had made a considerable number of investigations in this field on Lombroso's lines, but could not say that he had met with the same number of physical anomalies as Lombroso and his disciples had. Mr. Morrison considered that Lombroso's method had two defects. In the first place he compares the physical structure of criminals with the physical structure of soldiers. But soldiers are not a fair test, for they are the pick of the population, and not average types. In the second place he exaggerates the difference of bodily structure between the civilized and uncivilized man. According to Ratzel this difference "is more a difference in mode of life, in mental disposition (*Anlage*), in historical situation, than in physical structure." But the whole question demands fuller inquiry, and it would be most interesting to compare the results of Mr. Galton's anthropometrical investigations at South Kensington with similar results obtained in a similar manner from the examination of undoubted criminals.

Professor FLOWER, Mr. H. H. HOWORTH, and Mr. ATKINSON also took part in the Discussion.

Captain HASTINGS, in replying, said he was not aware of any superstitions connected with Po Tok's death.

The following Paper was read by the Secretary:—

*The MAORIS of NEW ZEALAND.*¹

By EDWARD TREGEAR, ESQ.

Tribes.

1. The natives are divided into tribes and sub-tribes ; but the tribe has somewhat of a clannish character, on account of common ancestry. The tribe (*iwi*) is divided into sub-tribes (*hapu*). The principal tribes are *Ngapuhi*, *Arawa*, *Rarawa*, *Ngatiruanui*, *Ngatiraukawa*, *Ngatihaua*, *Waikato*, *Ngatimaru*, *Ngatimamoe*, &c. Some of the tribes have from long defeat dwindled down almost to as small proportions as a large *hapu*.

2. The tribes are not distinguished by differences of dress, nor in the mode of wearing the hair ; slight differences do exist, but are not to be called tribal.

3. A very few of the tribal or sub-tribal names are derived from animals or objects ; even in these few cases, I think the name has been that of a man ; thus *Raukawa*, a plant, then, a man called after the plant *Raukawa*, then the tribe his posterity called *Ngatiraukawa* (*Ngati* = children of, descendants). The *Arawa* tribe are an exception ; *Arawa* means "shark," *Waikato* = "flowing water" ; but the *Arawas* have no "totem" respect for the shark.

4. The members of a tribe do not regard as sacred the animal or plant from which they may have derived their name, nor do they refuse to kill or eat it.

5. They have plenty of stories as to the origin of tribes, but they are to be found in the published works of Grey, Shortland, White, and others.

Birth, descent, adoption.—7. In ordinary cases or with common women there are no birth-ceremonies, but in cases of difficult parturition a *tohunga*, or priest, is in attendance, and he, together with the woman, repeats the *Karakia* (invocation) of *Hine-te-iwa* ; it commences—

"Weave, weave the mat,
Couch for my unborn child,"

or else the invocation commencing "Oh *Hine-te-iwa iwa*, release *Tuhuruhuru*." These were celebrated charms of great antiquity.

¹ This paper has been written in reply to the code of "Questions" issued by Mr. J. G. Frazer, and published in the "Journ. Anthropol. Inst.," vol. xviii, p. 431. The paragraphs are numbered to correspond with the original questions.

While the *Karakia* was being chanted, the father had to plunge into the river. If the child is not then born, the ancestral line, up to *rangi* (sky) and *tiki* (Creator), must be invoked, *i.e.*, if a boy is being born; if a girl, the mother's line of ancestors.

8. The mother is not secluded before birth; but she is *tapu* afterwards, until made *noa*, or "common" by ceremonies. The ceremony was performed about a month after birth, the mother being secluded till then, lest she might *tapu* any of the people engaged in *kumara* (sweet potato) planting. There were two different forms of the ceremony:—one was the *tua*; in this form, two fires were kindled ("new-fires" of course—made by friction of wood), one for the gods, one for the priest-chieftainness. Then the *tohunga* (priest) repeated the incantation beginning "Breathe quick thy lung," &c. Fern-root is cooked on the fire for the *atua* (gods); this is waved over the child by the priest, and afterwards placed in some sacred spot. The female tribe-priest (if there is one) waves the fern-root cooked on her fire, and touches the baby in several places, pretends to eat the fern-root, but does not; it is laid in a sacred place. If there is no female priest-chief (*ariki*), a figure is made of weeds to represent her. This removes *tapu*.

In the other ceremony, when the *tuapana* is chanted, it removes the *tapu* from mother and child. A number of clay balls are made by the priest, and little mounds near them; each mound is named for a god, and each clay ball for an ancestral chief. The priest then took a branch of *karamu* or of *kawa*, parted it, and bound half round the baby's waist, chanting the invocation called *tuapana*, beginning "There are the mounds risen up," &c. When this is finished, he sprinkles mother and child with water by means of a branch, and chants again. When the song is finished, he plants the branch, and if it grows the child will be a warrior. Then three ovens are made, one for the mother, one for the priests, one for the gods; food is cooked in them. A number of pieces of pumice are placed in a row, and named for the child's ancestors; then the priests offer food (from the god's oven) to each stone in turn, with the incantation beginning, "There is your food," &c. (the gods ate the "soul" of the food); then the *tapu* was removed, and the mother and child free.

There is no rule as to the mother's food during pregnancy.

9. There is no rule for the husband's conduct, nor is he subjected to any special treatment; there is no trace of the *couvade*, &c.

10. The child is named at the time of the purification spoken of above; this is called *iri-iri*, or baptism, sometimes, but is really more a "churching" than a "christening." However,

sometimes, with a great chief, the father, mother, and head of tribe went with the priest, who waded out into mid-stream with the baby and sprinkled him, reciting the incantation of, "Baptised in the waters of Tu (the war-god). Be thou strong," &c. The priest sometimes, at a particular time, repeats slowly, one by one, the names of the child's ancestors, and if the baby sneezes, that particular name just being recited is chosen; but most Maoris are named from "nickname" sources, such as personal peculiarities of self or parents, local names, "sounding sea," "angry sky," &c. There is never any godfather or god-mother.

11. There are no special observances in regard to infants whose elder brothers or sisters have died previously.

12. Infanticide, though common in Eastern Polynesia, is not so in New Zealand; there is plenty of room for all, and the tribe wanted plenty of boys for war, and girls as breeders. The Maoris idolize children and spoil them dreadfully.

13. When the father and mother belong to different sub-tribes, the father's landed property went to the male children, the mother's to the female, but all the children belonged to both tribes. If a girl married a chief of an utterly strange tribe, she lost claim to her mother's land, unless she could induce her husband to stay with her tribe, in that case she lost nothing, for the tribe gained a fighting man. The rules, however, are very intricate, and cannot be fully discussed in this place.

14. Adoption is sometimes practised, but is not common as in Eastern Polynesia. Children were generally adopted by close relations, such as uncles, &c. When a woman has lost her title to her mother's land by marrying a stranger, her brothers can secure her share for her children by adopting them.

Puberty.—15. There is no special ceremony performed on lads at puberty, except in the case of the eldest son of the head chief of a tribe. He has to be initiated into the secrets of all priestcraft and witchcraft as *Ariki* of the people. A fast is proclaimed, and the people are not allowed to eat, from dawn till after dark. A shed built of palm (*nikau* = *Areca sapida*) branches is made with an equal number of sticks on each side (no odd sticks anywhere), and the makers of the shed must all be chiefs. In this shed the old *ariki* sleeps the first night, and at dawn the young man is sent to him naked. (Naked, for fear garments defiled by having touched food should be present at sacred ceremonies.) The young chief is urged to sleep, and the priest watches for omens (*takiri*) of jerking. If an arm or leg jerk inwards it indicates luck, but if it jerk outwards the lad cannot be taught. Then the old man repeats the incantation beginning, "From whence come all things," &c., and afterwards

begins to teach secrets. This is what was done in New Zealand; in the old land whence they came legend says they had a *whare-kura* or college in which the young men were taught astronomy, agriculture, &c.—they were very sacred in this. But there has been no *whare-kura* in New Zealand.¹

A young chief had successfully graduated in this college if, on completion of his course, a slave being brought in front of him, he could strike him dead by repeating a charm. It may be that this statement will be disbelieved, but tapu is an awful weapon. I have seen a strong young man die the same day he was tapued; the victims die under it as though their strength ran out as water. Yet I never knew a *great* wizard.

16. There is, at these rites, no pretence of killing the lad and then restoring him to life.

17. During the initiatory rites, women could not go near a young chief; I do not know if seeing was prohibited, but it would certainly be avoided.

18. They do not practise circumcision, nor do they knock out, chip, or file the teeth, bore the nose, distend the ears, insert rings in the lips, or perform any other mutilations of a similar nature.

19. They all tattoo, but not at puberty—the full tattoo of a warrior took place after his distinguishing himself in war. The tattooing of a slave's face was only a vile practice, introduced lately for the sake of selling dried heads (fully tattooed), as European curios; as Maining was told by the trader, "'Eds was getting scarce." The patterns were tattooed, not incised. The men are tattooed on face and posteriors—women, a few lines on breast, slight pattern on lips and chin, and (sometimes in old days) on back part of leg (calf). Some women in South Island were tattooed on face like men; very rare. The drawings *made by me* for White's, vol. 1, "Ancient History of Maori," are good guides—the curved pattern (*Mataora*) never varies. There is a good example on pp. 331 and 332 of "Library of Entertaining Knowledge—the New Zealanders." But the real point is that on the brow *just between the eyes* is a difference which is individual, and is the "signum" of each (or was anciently). I say what I think of tattooing in "Ancient Alphabets in Polynesia."

An old legend states that Mataora went down to *Po* (Hades), and was there tattooed by his ancestors, who performed the actual operation on him at his request, because the marks were only *painted* on men's faces before that time, and would wash off. I think there is no truth whatever in the tradition;

¹ I have heard that there was a *Wharekura* at a place called Whanganui, but it was not *the* Wharekura.

tattooing is an extremely ancient practice, and I believe that I can prove etymologically that the *curves* of Maori tattooing are *snake-coils*, which they must have learnt far away from Polynesia—and even these are later than the *Mokokuri* tattoo of triple lines.

20. When men are having their faces tattooed, the priest or the persons sitting by, sing the "tattoo song," beginning "In a group we sit and eat together." The best Maori version, commencing, "*E noho ana, e kai-tahi ana*," may be found in Grey's poems (*Hakirara o nga Maori*), p. 57. If a girl, the song, "Recline, my daughter, to mark thee" (*Takoto ra, e hine*), Grey, p. 58.

A person being tattooed is prohibited from eating fish, unless the fish (sacred to *Tangaroa*, the sea god) is held up to see the tattooing. No gourd or calabash must be eaten, if children have playfully made tattooing marks thereon. The priest and all the people are *tapu* (on account of the blood), during the operation, but the ceremony of making native ovens with hot stones is gone through—priest's oven, gods' oven, oven for the tattooed man. The priest handles one of the hot stones of the gods' oven, thus transferring the *tapu* to their food, which is hung up in a tree. After the eating, all are *noa* (common, not *tapu*).

21. Answered above.

22. I do not think that there is any mark distinguishing tribes, &c., still we do not know everything (probably never will now) about the full signification of *tatau*.

23. I never heard of any ceremonies performed on girls at puberty. I think I should have been sure to have known.

24. *Ibid.*

25. Women were not secluded at menstruation, but they were *tapu*, and would not be allowed to touch food that was being cooked—some of the men might eat it by accident, and that would *tapu* them instantly.

26. They thought that the *menses* contained the germs of unformed infants—the seed of humanity—the germs became the malicious deities called *Kahu Kahu*, of which I will treat under *demons*. If a man touched her he would be *tapu*, if he had connection or ate food cooked by her, *tapu* "an inch thick."

Marriage.—27. There is no absolute law as to marrying within or without one's tribe—that is, no law *personally* affecting the man or woman—only as to the land.

28 and 29. As a general rule the girls had great license in the way of lovers. I don't think the young woman knew when she *was* a virgin, for she had love affairs with the boys from her cradle. This does not apply of course to *every* individual case—

some girls are born proud, and either kept to one sweetheart or had none, but this was rare. When she married it became very different; she was then *tapu* to her husband, and woe betide her if she was guilty of light conduct.

30. Anyone outside brother and sister could marry, although marriage of first cousins was greatly disliked. They seem aware of the weakening effect of the "in-breeding." There are cases in which (especially in legend) even these bonds were broken, but not as proper social practice. A man had to be a very strong and powerful chief who could dare to tamper with daughter, daughter-in-law, sister, &c., and then he earned widespread denunciation for himself and stigma for the offspring.

31. A man, if powerful and wealthy, might have several wives; but as the tribe supported all in food, the mean men would be prevented, in some way or another, from keeping large establishments.

32. There is no polyandry, marriage relations are strict, unless the husband gave consent, as for a guest, &c.; but I know of one instance, and only one in ancient legend, wherein a woman (she was a goddess or demi-goddess), had not only two husbands at the same time, but these two husbands were brothers.

33. Polygamy is caused in some cases simply by the desire for the women, also by early betrothals, and having to take the widow of a deceased brother; alliances with other great chiefs, or a love of display by a show off of a big retinue; as each wife had her separate plantation, *Mara*, the more wives a chief had the more able was he to entertain guests; but there was no one cause in particular; the wives worked, and so did the chief himself, even the greatest.

34. Betrothal of children was common among people of birth. If no betrothal, there was generally a lot of talk and squabbling, every one in the tribe thinking he had a right to interfere, till at last the young couple, if lovers, would flee to the bush until their living together was agreed to. The girl generally began the courting. I have often seen the pretty little love letter fall at the feet of a lover—it was a little bit of flax made into a sort of half knot—"yes" was made by pulling the knot tight—"no," by leaving the "matrimonial noose" alone. Now, I am sorry to say, it is often thrown as an invitation for love-making of an improper character. Sometimes in the *Whare-Matoro* (the wooing-house), a building in which the young of both sexes assembled for play, songs, dances, &c., there would be at stated times a meeting; when the fires burnt low, a girl would stand up in the dark and say, "I love so and so, I want him for my husband." If he coughed (sign of assent), or said "yes"—it was well—if only dead silence, she covered her head

with her robe and was ashamed. This was not often, as she generally had managed to ascertain (either by her own inquiry or by sending a girl friend) if the proposal was acceptable. On the other hand, sometimes a mother would attend and say, "I want so and so for my son." If not acceptable, there was generally mocking, and she was told to let the young people have their house (the wooing-house) to themselves. Sometimes if the unbetrothed pair had not secured the consent of the parents, a late suitor would appear on the scene, and the poor girl got almost hauled to death between them all. One would get a leg, another an arm, another the hair, &c.—girls have been injured for life in these disputes, or even murdered by the losing party.

There was generally a show of force, more or less severe; but after she had been taken away, the parents came to see the pair, and when presents had been interchanged, all were satisfied. If the couple had been betrothed at infancy there was no ceremony but a feast of the relatives and tribes of both, the bride was clothed in new mats and handed over to her husband, by whom gifts were made. "Marriage" was merely *moe-tahi*, "a sleeping together."

35. Often the husband went to live with his wife's people—not, of course, if he was a great chief, or had several wives. If he went to live with his wife's people, he was considered as one of her tribe, and fought on their side—sometimes she would leave him and go back to her own people if he did not.

36. There is no preparation for marriage on the part of either bride or bridegroom, by fasting, bleeding, or any other way.

37. Answered above.

38. The bride is not veiled.

39. Nor is either she or the bridegroom ever represented at the marriage ceremony by a proxy or dummy.

40. There is nothing corresponding to bridesmaids or best men.

41. Nor are any ceremonies observed by bride and bridegroom on the day after marriage.

42. A man cohabits with his wife immediately after marriage.

43. And lives openly with her.

44. The Maoris had no custom which required or permitted that the wife should be touched by any person other than her husband.

45. Men abstain from women at menstruation, pregnancy, after childbirth till the child is weaned, and previous to and during hunting, fishing, and war.

46. As quite an occasional thing a man who had *many* wives would lend one of them to a guest whom he wished to honour greatly. He would not let his first or chief wife be touched,

but one of the inferior ones perhaps. He could let a guest have one of the girls. In Hawaii, whether the woman was married or single, she would have been thought very churlish and boorish if she refused such a slight favour as connection with any male friend of the family.

46A. A widow went to her husband's next brother, unless he chose to forego his right. Her proper course was to strangle herself.

47. They may all speak to and look at each other—there was no restriction.

Disease and Death.—49. They believe that disease is caused by the entry of an evil spirit into the body; or at all events the anger of some deity or demon (*Atua*). Even slight sicknesses were supposed thus to be caused. Said a great chief once, "My *Atua* is a boil."

50. And they try to effect a cure by exorcisms, &c., made by the priest. Rheumatism, however, they cured by means of the many hot springs (charged with sulphur, &c.), in parts of the country. Poisoning with *Tutu* (*Coriaria ruscifolia*) berries they cured by holding the patients over the smoke of weeds and leaves. Poisoning by eating the kernels of *Karaka* (*Corynocarpus levigata*) by burying the patient in the earth up to his neck. Bones were well set in splints of bark; wounds were generally left to themselves after they had extracted any broken pieces of spear or bone; they healed in a manner an European could hardly believe. I have seen a Maori speared with a big rafting spear (an iron-shod pole thicker than the wrist), the point driven through the breast (just under the collar-bone) and coming out at the back—in a week's time he walked fifteen miles crossing a mountain range—the wound being healed.

They also used the bark of the *Rimu* (*Dacrydium cupressinum*) beaten into a pulp as a cure for burns, when placed on the sore. Dysentery and diarrhœa were cured by chewing the leaves of *Koromiko* (*Veronica* sp.) and the *Kawakawa* (*Piper excelsum*).

There was a charm beginning "Return, oh ye gods of the land" (*Te whai kurukuru matahi*), Grey's poems, 430, for burns. The charm for broken limbs begins, "O thou *Tiki*, give me thy girdle as a bandage for this limb," said whilst the priest is binding up the fracture.

52 and 53. The ceremonies at a death were very intricate, and differed in various parts of the islands. Slaves were quietly put into a hole. Chiefs were carried when dying into some shed, as death *tapued* the house. Friends gathered when they heard the *tangi* cry (a loud vibrating wail) from the wives and relatives—then there were cuttings of the face with sharp shells or pieces of flint by the women and of the neck on one side by

the men. The hair was also cut off on one side, and sometimes a few long locks left untouched as a memorial of the departed—this was called *Pakipaki taha*. The burden of the lament was, "Go, go, we follow." The friends, who came from long distances to lament, wore wreaths of green leaves or of *lycopodium*. Sometimes the body was buried: in other parts of the country it was placed in a little house with the greenstone club, &c., of the deceased: sometimes in two pieces of a canoe placed upright together, the corpse being tied in a sitting posture on a grating through which the decomposed parts fell. At other times it was placed in a small canoe and set up in the branches of a tree. Slaves were killed sometimes and the chief wife strangled herself—these were buried with the husband. A *taro* (*Colocasia antiquorum*) root was placed in the hand of a dead child that he might have food for his journey to *Reinga*; food was also buried with a chief. The exhumation (*Uhunga*) took place from a year to two years after death. There were many most intricate ceremonies used:—The consecration of the spade with which the body was dug up, the charms for the binding up of the bones, for the scraping, for the bearers, lustrations of those engaged, "making common" those engaged in the work (*i.e.*, lifting the *tapu*). The bones were scraped, anointed, decorated, painted and set with feathers. When they had been seen and wept over by all the relatives, they were packed away in the dark ancestral burial cave, or else thrown into some inaccessible rift or deep chasm, lest some enemy might get hold of the skull, to taunt it or to use as a baler for a canoe. Fish-hooks made from the jaws, flutes, pins, &c., from the bones, were supposed to be terrible insults to the relatives—hence the secret sepulture.

54. The ghost of the departed was not feared, if the proper ceremonies had been performed. If they had not, the spirit might become a *kahukahu* (which see), though not of the worst type.

55. Persons who have touched the corpse are considered very unclean; they have to be charmed over, &c., by the priests.

56. The relations do not have to observe any special rules.

Murder.—58. Murder must be revenged by every member of the tribe until satisfaction has been obtained. A chief, when dying, generally left as his *poroaki* (last words) some reminder of revenge for his people to carry out, and would generally nominate some one person to devote himself to this especial purpose. These death orders were looked upon as sacred commands. Vengeance, or propitiation by bloodshed, could be obtained by assaulting a tribe who had nothing to do with the cause of quarrel; but, generally, the tribe or family of

the murderer was singled out for vengeance, and a vendetta declared.

59. I cannot remember any instances of compensation for homicide being permitted; there was little property to offer; "blood for blood" (somebody's—not too particular always as to whose) was the rule.

60. I do not think that any purification was needed after murder *unless* the dead body had been handled. "Murder" is not regarded in the English way. As a chief said to me, "If I go out for a morning walk with my spear, and I see a man, and I push my spear through him, *that* isn't murder—that is '*killing*.' But if I invite him to my home, give him food, tell him to sleep, and then kill him, *that* is '*murder*'" (*Kohuru*).

Property and Inheritance.—61. Land was held primarily by tribal right; but within this tribal right each free warrior of the tribe had particular rights over some portion. He could not part with the land because it was not his to give or sell, but he had better rights to certain portions than others of his tribe. He would claim by having the bones of his father or grandfather there, or that they once rested there; or by the fact of his navel-string having been cut there; or by his blood having been shed on it; or by having been cursed there; or by having helped in the war party which took the land; or by his wife being owner by descent; or by having been invited by the owners to live there. The tribe inherit either by conquest or possession—conquest mainly—but if the scattered remnant of a vanquished tribe should be allowed by the victors to return quietly and their occupation be winked at—after a certain time they have a title by occupation.

62. A man's property descends to his sons, and a woman's to her daughters. The whole of a man's movable property was his own, his arms, decorations, canoes, &c., but so constantly was the law of *muru* or plunder (made by custom, having force of laws) carried out, that a chief often had little he could really call his own, except his personal weapons, ornaments, &c., which were *tapu* by touching his sacred body. A chief could *tapu* a certain thing by saying, "That canoe is my back-bone," &c. Then, unless one was of greater power than he, it was untouched, it became really (for all practical purposes) the chief's bodily part. His house and fences, his plantations, &c., were his own till they were *muru*.

63. Well-born women may inherit property. But the title of women to lands ran out sooner than in the male line. A chief's granddaughter can claim on her grandfather's land equally with his grandsons, but on the death of *her* grandchild the land reverted to the male line. If she marries a man of another distinct

tribe and *goes with him*, she loses her land; so says the proverb, "The woman goes away and goes without her girdle."

64. The younger child never succeeds in preference to the elder, unless there is some shameful incompetency or outlawing against the latter—madness, black treachery, or something of the kind—so rare as scarcely to be worth noticing. The elder brother inherited, then the next, and next—when the brothers were dead, the land reverted to the children of the eldest.

Fire.—65. Fire is obtained by friction of wood—one pointed piece is rubbed in a groove upon a flat piece with a longitudinal motion. A little dusty fibre is scraped by this process up to one end, then this begins to smoke, and it is in the nursing of the baby-spark with tinder, &c., that art is shown. It was generally, when used for "common fire," kept lighted as long as possible, and firesticks were carried to start new fires with—but on all solemn occasions "new fire" was made. A chief, too, must have his own sacred fire to sit by, lest perchance some inferior person may have used it, or (horror of horrors!) used some of his fire to light another on which food was cooked. This would be (metaphorically) cooking the chief himself! Fires were always made new for ceremonies such as those connected with the purification after childbirth, the haircutting of a boy, the war-parties' return, &c.—in almost all ceremonies food was cooked for the gods, and of course *no* "common fire" could be used.

67. I have given the best Polynesian stories in a paper on "The Origin of Fire."

Food.—68. Certain foods are forbidden, but not as in Samoa, where almost each family has some particular food forbidden because sacred to the household god—this looks like totemism. The Maori of New Zealand ate almost everything but lizards (these being held in superstitious awe). The cuttle-fish was the property of the *Ariki* (priest-chief), and was only shared by him with another as a high honour. *Kumara*—sweet potatoe (*Convolvulus batata*)—was sacred while growing, until made common by the firstfruits being consecrated. Women were allowed to eat what the men ate, but human flesh was generally denied them.

69. The women and men ate apart. Generally each man ate apart. A little basket of food was brought to each by the women; if to a great chief, by his male slave. Eating was always done in the open air—food would *tapu* a house, and so *tapu* any one entering. I don't know *why* they don't eat together—but it is so.

70. Children generally eat with the women—scraps are thrown to them and they play round like kittens.

71. The women generally eat together, but not the men.

72. Cannibalism was common formerly. They ate their enemies, and some very wicked old ruffians would eat a slave now and then.

73. Desire for revenge was the reason given for cannibalism, cooking and eating being the greatest of insults. They had some idea, I believe, that the courage of the person eaten would come to them, but I do not think it was a leading idea—at all events with the majority it was overgrown. It is possible that scarcity of food in siege-time may have helped the practice—they had plenty of food at ordinary times. Some old Maoris declare cannibalism to be a recent invention—this is not true; it is mentioned in a very old legend, and is a world-old practice with all savages, even our own peoples: the other Polynesians, even if not cannibals, had customs pointing back to days when they, too, ate human flesh.

74. There were no special ceremonies at cannibal feasts, nor were any special vessels or implements used.

75. The use of human flesh was not confined to any class or sex, as even the women ate it sometimes.

76. If the eaten person had been a doubtful enemy, they dried his head as a trophy, and made flutes of his thigh-bones, &c.—otherwise the bones were thrown away.

77. They never drank the blood of either men or other animals as blood, but they did not avoid it particularly.

78. There are no particular occasions when the sight of blood is avoided: nor are they ever prohibited from seeing the blood of persons of the opposite sex.

79. They fasted on certain occasions; at the hair-cutting of a boy-chief all the people fast, so does the young man initiate (see above, 15). No food is cooked in the settlement the day before a war party departs, until the priest has gone through his divination by the *niu* (throwing spears of fern stalk).

80. See 73 above.

Hunting and Fishing.—81. They had no hunting in the proper sense of the term, there being no large land animals. The *moa* is not mentioned in any of their *reliable* legends; that is, not mentioned as a large bird. In a paper on the "Maori and the Moa,"¹ I have already expressed my belief that the Polynesian Maoris did not even know the *Dinornis*. Rats were hunted (the small frugivorous native rat—not the common Norwegian species brought by Europeans, and now swarming), and for this purpose roads were cut in the forest. Before they started the hunting party gathered together and sang the charm commencing "Give thanks above," &c. (*taumaha ki runga*). Two

¹ "Journ. Anthropol. Inst.," No. 63. May, 1888.

parallel lines, miles long, were cut in the bush, and traps baited with the berries of the *miro* (*Podocarpus ferruginea*), &c. Then the *Taitai i runga* was sung. When they had caught a great many they made an oven for the gods; into this a rat was put; it (the rat) was then lifted up on an altar and the *karukia* beginning "The smell is drawn out" (*Te kaha ko ia unuhanga*), was used by the priest, then other omens were made, one for the priest, one for the hunters, one for the common people (*noa*), *i.e.*, not hunters, &c. The fishing ceremonies were far more numerous. The beach and the whole sea near would be *tapu* the day a new seine net was first wetted. The seine is *tapu* till the first fish is taken and set free—set free after a hair from the head of the priest has been put in its mouth, with a prayer that it may tempt other fish to come and be caught. The first fish caught in a new canoe was always offered to the gods as offering for the men; the second for the women—sometimes thrown back into the sea as an offering to *Tangaroa*, the ocean god. Before commencing fishing the priest (set apart for fishing charms, as another for the crop of sweet potatoes, &c.) made them fasten all the hooks in regular order along the sides of the canoe, and then commenced the long incantation, "Turn to me, turn to me, O Maru" (*Takuri mai, takuri mai, E Maru*). When the fishing was over and the party returned to their *Pa*, three ovens were made—one for the chiefs, one for the priest, the others for the assemblage; then the priest, holding up a fish by the gills, repeated the charm of "the fish of Tangaroa" commencing *Te ika, te ika, i waitotara*—and the ceremonies were over. The taking of whales, seals, &c., was very *tapu*, and woe betide the man who cut up or tasted one of these creatures till the ceremony of making the animal "common" had taken place. Some of the most tragical (legendary) events in native history arose from this sacrilege. There are no rules as to eating, speaking, &c.—except those mentioned above. They did not scarify.

83. The women and children do not observe any special rules while the men are out hunting or fishing.

85. Nor are any ceremonies observed for the purpose of appeasing the spirits of the animals and fish that have been killed. The bones are sometimes used for tools, &c., but are mostly thrown away.

Agriculture.—86. They had no ploughs, but they were careful and diligent cultivators. The ground was turned over with an instrument called *ko*, a pointed rod with a crooked foot rest some inches from the point. The *kumara* sweet potato plantations were tended with the greatest care—the plants set in rows of beautiful regularity. As the plant needs fresh gravel six inches deep

the labour of bringing it from (sometimes) long distances was very great. The taro, *Arum esculentum*, was also cultivated; the *huc* (gourd) was grown everywhere. The *kumara* crop was sacred; the persons working at cultivating it were sacred, and the offering of the firstfruits was one of the solemn religious ceremonies. The firstfruits were offered to *Pani*, the son of *Rongo*, the god of the *kumara*. The ceremony for making sacred the *kumara* cultivators was called *whaka-mahunga*.

87-96. They have no special ceremonies at sowing, ploughing, or harvest; nor have they any rules as to eating the new corn and fruits, nor as to the fire used to cook them. They do not sacrifice to obtain good crops, nor to save the crops from blight, hail, &c., nor have they any ceremonies for keeping vermin from the crops. There are no superstitions as to the first corn cut or the last corn cut; nor is any portion of the crop preserved with special ceremonies. The only ceremonies are those described above in connection with the *kumara* crop. The *kumara* was sacred to the gods of peace. Sometimes skulls, &c., would be placed in a row with many ceremonies, every year, to help bring a good *kumara* crop. The skull and bones of the giant *tu hou rangi* were kept for many generations to bring out and set up in the sacred places of the *kumara* fields.

War.—97. If war is decided on, the first thing done is for some leading priest to consult the omens by casting the *niu*. This is done by the priest procuring a quantity of fern stalks, representing spears—and a quantity of others to represent the warriors going on the war party (*taua*). The sticks representing the chiefs are one by one stuck in a mat and a fern stalk darted at each. If the spear falls on the left side of the man's stick he will fall, if on the right he will live. Then with sticks named for enemies he darts at others named for the men, women, and children who remain behind, lest they should be attacked in the absence of the warriors. When this ceremony was over, he lifted the *tapu* from the settlement. A fast had been held while the ceremony was proceeding. Sometimes the gods were propitiated with offerings—particularly the war-gods *Tu* and *Maru*. The priest generally, under inspiration, gave the answer, and if it was for war, he would chant the song concerning the "girdle of *Tu*," "Give my girdle of war," &c. Then when the expedition is about to start they all go to the side of a running stream, and the priest takes a branch of the *karamu* and sprinkles them one by one, saying, "Thou art baptised, oh son, to war; wield the weapon of *Tu* in the tide of war"—this is the *Tohi taua*, "War baptism." A young chief on his first war party always received a special baptism, where he and his companions had to stand naked in the water and be sprinkled and charmed.

Until he had passed through this ceremony and the bloodshedding he was a nobody. If he had shed blood in the battle, the chief called him forth and broke the weapon he had used, using the *haha* or "breath charm," "Ha! ha! ha! this is the wind feeding," &c. After this the youth was *tapu* for some long time yet; they could not touch a woman, &c., or touch their own sacred heads. All men on a war party were *tapu* to women—they could not go near their wives till the fighting was all done. They recited charms over their weapons before starting. They asked for alliances by sending baskets of cooked (human) flesh—if this present was accepted and shared, the alliance was acceptable, if not the food was sent back by one of their own men the same day. Omens were sought—a blow-fly crossing the path is ominous of defeat; startings in sleep were some of them unlucky; a kite was flown by the priest and allowed to go loose over the enemy's *pa*, if the string caught in the palisades that was an omen for victory; if the priest dreamt that his deity was overcome by the deity of the foe the party turned back directly. There was also a ceremony of making *tuahu* (sacred mounds) on the march, when the priest would consult the gods by setting up *tokomauri*, or "staffs of life," in the mounds and, turning his back, would repeat an incantation—the gods being supposed to move the sticks in answer. There is a story that a chief in the North offered up his son as a burnt-offering in time of war to see if the smoke would pass over the *pa* of the enemy, which would, if so, be captured. But this story is very doubtful, I think, as being opposed to native feeling—they might cook some one else's son, not their own. [Since writing the portion in body of MS. an instance of such sacrifice comes to my memory in ancient tradition. When Manaia was coming to New Zealand in his canoe *tokomaru*, he said to his men, "Let my brother-in-law now be slain as an offering to the gods that they may be propitious to this canoe of ours." He was killed.] Of course they had to cook for themselves on a war party because there were no women with them, but they were very particular that food was not passed by one in front of another, or put near a weapon, or touched by the right hand: it had to be carried and eaten with the left hand.

99. Those left at home did not observe any special rules unless there were bad omens, such as red sunset, owl crying in day time, &c. In such a case the women would not be allowed to cook for the men who remained, and the men would have to use the right hand for food, &c., like the war party.

100. They did not mutilate in any particular way except by cutting off the heads and drying them as trophies. Of course in the cutting up for cannibal feasts there was mutilation and the

bones were made into flutes, pins, fish-hooks, &c. The skull (as the greatest of indignities) was used sometimes as a container for food or a canoe bailer. The teeth were sometimes made into necklaces. A small piece of hair was generally torn from the head of each slain person and kept for the home-going ceremony.

101. When the fight was over they formed in ranks, three deep, each headed by a priest, who received from each man a portion of the hair from the victims—this was waved as a wave offering to the gods while the war party sang the war song. On their return, when they drew near to their own tribal land they perform the ceremony of *whaka-takurikuri* ("turning round to look back.") They dig a small hole for each head of a great chief (of the enemy) brought back; turning round towards the land whence they have come, the priests wave and shake the heads (this is called *pioi*) as a challenge, and to allow the heads to bid farewell. The song begins "Turn thou, look back, look back!" &c. When they approach the *pa*, they are met by the head priest or the priestesses in a body, and they are sung to thus, "Whence come hither the war party of *Tu*?" (*i haere mai i hea te tere o tu*?) The war party halt and commence a chant, "We come from the land, we come from the sea," &c. All the people wave their garments, and cry "Hither! Welcome!" The head priest gathers the remaining locks of hair brought by the war party and offers them to the god of war; then they dance the war dance (*tupeke*); then they proceed to the edge of the water and sit down in lines along the bank. The priest throws off his clothes, wades to the other side of the stream, and offers up a sacrifice of some human flesh, a round pebble and some fern-root, repeating the incantation, "Thou canst now eat and consume," &c. This lifts the *tapu* from the warriors. Then comes the *tangi* or lament for the warriors who have fallen—then the assembly, in which all the story of the war is told, deeds of prowess related, &c.

102. There are no special rules for individuals, only for the party of warriors.

Government.—103. They had no proper form of government: a republic with leading men, or an oligarchy with a very large aristocratic class, would partly describe the system, but only partly. It was not a republic, because the right of heredity was enforced and of primogeniture—nor was it an oligarchy, because every free man was a member of the council. There was no King; the chief was the head of his tribe and when several tribes united for war, the post of leader was given by consent to the best fighting man. The influence of the highest chiefs was largely a spiritual influence. The Ariki was the first-born of the elder branch, the head of the clan, priest as well as chief. To

him descended the high ancestral knowledge, the command of the most potent charms and spells, the right of precedence everywhere. If the first-born was a female she received the title of Ariki, but also the name *Tapairu* (now applied to the Queen). She was a very potent person in the tribe, although, of course, being under the disability of womanhood, she had not all the privileges, could not lead in war, lift the blood-*tapu*, &c. The male Ariki was always sacred; even if he did not fulfil the notions of his people by want of courage (a rare case), of hospitality, or of practical wisdom, so that another brother was made leader of the tribe in his place, still the elder was the "opener of the womb"—and a necessary person for all sacred ceremonies. Next to the Ariki came the *Tino Tangata*, or head man of each sub-tribe; then the *Rangatira*, or warriors, the "free and independent electors"; lastly, the slaves.

104. The chieftainship is hereditary for the Arikis, but elective for the war-chief. Of course there was no election by ballot, it was generally almost an understood thing as to the leader—the *prestige* would decide without saying. The chieftainship passed to sons first; failing these, then to brothers and sisters; then to half-brothers and sisters; then to uncles and aunts. A curious point was that a son was greater than his father, because he was the result of two great people coming together, while his father was only one great person the child held rank both by father and mother. From his birth the Ariki was the greatest person in his little world, till his own son was born. The power of an ordinary chief in peace time was not great; and, however influential, he could not *compel* the men to do anything—he really had little authority except over his own family and slaves. The Ariki who could *tapu* the whole place or fleet was a power, and any chief could *tapu* a thing by naming it after himself, his head, &c., but if a stronger or greater man came along he could break the *tapu* of the lesser with impunity.

Oaths and Ordeals.—105. No special forms of oaths and ordeals are in use among them.

Salutations.—107. The *hongi*, or nose-pressing, was the kiss of welcome and also of mourning and sympathy. The general salutation was a waving of garments and shouts of *nau mai! haere-mai!* &c. (welcome! hither!)

Arithmetic.—108. They count up to a thousand, but I think that over 100 the ancient Maori was not very sure.

109. They do not count by fingers and toes.

110. They sometimes use sticks for the high numbers, but not more than ordinary Europeans do to assist the memory—they have great arithmetical ability.

111. I am doubtful over the 5. I have been at work for

years in arranging the Polynesian languages in a comparative manner and I am still puzzled. People who never gave ten minutes real study to the subject say that because *rima* in Maori means "five," and that *rima* (or *lima*) in all the Polynesian dialects means "hand" and "five," therefore the Maori word *ringa*, "hand," is the same as five (*rima*). But I cannot recognise any other such change as *m* to *ng*, and I find that *ringa* means "hand" in other parts of Oceania besides New Zealand. So I do not feel sure that in New Zealand "hand" and "five" are the same words—though they are in other places. None of the other numerals seem to show connection with limbs, fingers, &c.

112. *Mano*, "thousand," is really "many," I think; after 100 they were hazy.

Writing.—113. They sometimes sent symbolical messages, as by the transmission of articles emblematic of their intentions, but they used neither quipus, notched sticks, nor any other regular method. I believe that tattooing was originally a writing, and that characters were printed on the skin. The word *tatau* means in Polynesia not only "marking the skin," but "counting, marking boundaries, making communications, printing, painting, reckoning descent, teaching, learning, giving publicity to," &c., and as I find crosses and arrow heads used in old tattooing I have written a paper (*Transactions New Zealand Institute*, Vol. XX, "Ancient Alphabets in Polynesia," p. 353) giving all I can find on the subject.

Measurement of Time.—114. They knew the year as *tau*. They counted by nights and by moons—also by stars. A division of time generally was *wa* (a word signifying "division," "to divide") now used for "an hour." The year was divided into two great seasons of summer and winter. There are varying lists to be given of the nights of the moon—the names seem to have differed in different localities. Sometimes they divide the month in halves or fortnights by "moon growing" and "moon lessening." They corrected their lunar error (in year) by observing the rising of the Pleiades and Orion. The most accurate way of counting the beginning of year was by observing the first new moon after the star *Puanga* (Rigel) was seen in the morning. The four seasons were named from agricultural operations, as Preparation, Planting, Cessation, and Harvest.

118. They took great notice of the flowering of plants and of the mating of birds, &c. Thus Spring (our August) was announced by the *karaka* (*Corynocarpus legicata*) blossoming and by the arrival of the cuckoo (*pipiharauroa* = *Chrysococcyx lucidus*). In September the *kowhai* (*Sophora tetralpera*) flowers. In October the *tawera*, the edible flower of the *kickie* (*Freycinetia*

Banksii) is ripe. In November the *rewarewa* (*Knightia excelsa*) blossoms. In December the *rata* (*Metrosideros robustus*) flowers. In January the *karaka* berries (see above) are ripe. In March the *kumara* (sweet potato=*Ipomœa batatas*) is ripe. In April the cuckoo leaves.

119. They have no names for the months, but only for particular periods. I fancy that the need of correcting lunar months into solar rather puzzled them.

121-123. They do not seem to have observed the solstices and equinoxes, nor have they any ceremonies at the end of the old year and the beginning of the new one. No artificial time-keepers are in use among them.

Games, Dances, &c.—124. They had the following games:—
KITE-FLYING. The kite is called *kahu* (which by a curious coincidence also means "hawk") and *pakau* (wing). These were made of leaves of the *rauipo* (*Typha angustifolia*) sewn together on a light frame. It was a game mentioned in ancient legend. **TOPS:** these were called *kaihotaka*, *kaihora*, *potaka*=whipping tops; *potaka-whero-rua*, a top with two points. **CATS CRADLE**, *whai* or *maui*, played in the most ingenious manner, far exceeding that of the European child-game; *maui*, fishing up the land; *tawhaki* (lighting), ascending to heaven, &c., being supposed to be represented: many varieties. **SKIPPING-ROPE**, *piu*, used as among Europeans, but generally by two holding the ends and many jumping. **DUCKING** (*taururumaki*) one another, one holding the other's head under water. **SWING**, *moreve* or *moari*, a pole with ropes at top held by runners, the "Giant's stride," sometimes played on edge of cliffs, half the swing being over the abyss. **DART THROWING**, *neti* or *teka*, throwing with light spears to see who can throw farthest. **WRESTLING**, *takaro-ringaringa*, played with any hold. *Para-toctoe*, throwing light reeds at each other. *Para-mako*, throwing spears at each other—evaded by twisting the body only—a very dangerous game. *Moto* and *meke*=boxing. **DIVING**, *kokiri*; this was done by a great number diving feet foremost one after another from a high bank, or running along a pole projecting over the water. **BALL**, *poi*, a game played by a party singing a song, each having a ball fastened to a string, which is thrown about by all with the same movement and in perfect time. It is very graceful and pretty. **DISC**, *porotiti*, a boy's game of twirling a disc. *Ti*, a game played with the fingers (like *mora*, an Italian game). *Komikomi*, a similar game. *Punipuni*, a game played by slapping the hands and interlacing the fingers while singing a song. *Tutukai*, a kind of "hunt-the-slipper," a small stone being passed round the circle, each person holding his fist closed and one trying to find the stone. *Kopere* and *kotaha*=sling

STILTS=*pouturu* and *araporaka*. DRAUGHTS, *mu*, some think an introduced game, but I think it can be well proved to be ancient. PROVERBS, *whaka-tauki*, finding out puzzling ones. *Poroteteke*, a game played by boys standing on their heads and marking time with their feet. HIDE AND SEEK=*whaka piri*, as with us. *Kai*=Riddles, or a puzzle to undo a knot.

There is one legend so ancient that it is known both in Samoa and in New Zealand, although so many centuries have elapsed since the separation of the tribes that Samoan is perfectly incomprehensible to a Maori.

This legend (the story of *Kae*) gives a list of the games played to amuse *Kae*, and it contains the following names:—Singing, playing on the flute, beating time with castenets, playing at *ti* (of this three kinds—one like *mora*, one clasping fingers, one in which they throw short sticks one to another) playing on a sort of Jew's-harp (*pakuru*), making puppets dance, all singing while they played with large whizzgigs (discs = *porotiti*). They made him laugh at last with a comic song and dance.

125. The chief dance was the *haka*—a sort of posture dance, performed by rows of dancers (singers) all making the same motion in the most perfect time. A good *haka* conveys a notion of rhythm worth seeing. There were war-dances called *ngarahau*, other dances called *hari*, *patere*, and *ngahau kotaratara*, a triumphant dance, and *kanikani*, a sort of see-saw dance. Sometimes the dances were conducted altogether by men, sometimes by women only—sometimes by both together. They had no “spin” dances like our waltz or polka; they were all stamping, leaping, swaying and posturing dances—sometimes very exciting and often very indecent. They had no dances that I know of in which animals were imitated—it is ages since they were acquainted (if ever) with large animals; and I have not recognised any attempt at such a thing. I do not think that any of their dances were really religious, but their chants were accompanied by waving of arms and motions difficult to distinguish from their dances.

Magic and Divination.—126. They practised magic and witchcraft very greatly. The sorcerer was everywhere, but not exactly as a professional. *Tohungas*, that is the ordinary priests, were generally called in to exercise the art for the common people, but chiefs of rank, and especially Arikis, possessed it in high power. One way to bewitch a man was to get him to break the *tapu*; another one to bury a *tapued* image or stone in his courtyard at night. A girl who did not respond to her lover's advances could be bewitched, driven mad, and killed. The usual way of obtaining power over another was to obtain (European fashion) some

of the nail-parings, hair, &c., anything of a personal nature, to act as a medium between the bewitched person and the demon. Spells would be muttered over these relics, then they were buried, and as they decayed the victim perished. Sometimes the *makutu* was used for a good purpose; thus, if any one of a fishing party had stolen my line, hook, &c., I would make a spell which would cause a *taniwha* (water-demon) to rise and carry off the thief. I find too that young people were told they would be *makutu* if they laughed at a sick dog—if they stole food from the food store, &c.

127, 128. The most powerful sorcerers were the hereditary heads of tribes (*Ariki*). These had sets of witch charms and incantations descending "in tail" from eldest son to eldest son. A *tohunga* or ordinary priest imparted his charms to his chosen disciples, to his "chelas," as the Buddhists say.

129. They could do anything—so they say. Make storms, lay storms, kill, wound, stupefy, derange, even bring to life again, but this only under certain conditions. Dawn must be near, the Pleiades high, the dying man must have a shivering fit and the robin (*toutouwai*) must be singing at the same time as *tawera* the morning star is in sight. When the great priest, *Ngatoro-i-rangi*, was coming here in the migration of the New Zealanders, he, indignant at an insult to his wife, "changed the stars of evening for the stars of morning"—but he was a very high and mighty priest.

130. The sorcerers never dress as women, but the dress of men and women was much alike—the women had mats of a somewhat finer quality sometimes than ordinary men, but the valuable heirlooms (cloaks, &c.) were only worn by the high chiefs—they were *tapu* of course to others.

131. The *tohungas*, having more knowledge than the crowd, were generally looked to as interpreters of omens, but all the people were constantly in superstitious fear of ominous occurrences. Convulsive startings in sleep, the twitching of the arms and legs outwards or inwards were always taken as omens. Tripping the foot in starting on a journey was bad and would cause them to go back. If in travelling the feet between the toes get filled with fern, that is evil. If one's chin itches it is a sign you will soon eat something oily. An ember popping out of fire or the singing of gas from burning wood, were ominous. Aerolites, meteors, &c., were unlucky; so was the moon near a large star. Some of them disliked the morepork, or little owl (*ruru* = *Athene N.Z.*); all of them hated the lizard. Dreams were recited and listened to with great attention.

131. They drew omens from the flight of birds, not after the fashion of the haruspex. If a party on the march heard the

little bird called *tiraucke* on their left hand, it was war, if on the right, feasting.

132. They used the *niu* for casting lots, as a divination in other matters beside war.

Religious and Political Associations.—133. I have mentioned *whārekena*, the college which is traditionally said to have existed. Herein Religion, Agriculture, Astronomy, &c., were taught. I do not know of any other association. Politically, they used to assemble in councils called *runanga*, but these were tribal meetings (folk-motes). I am trying hard to find if my notion of a religious Freemasonry (extending through the Pacific) has solid ground.

Men as women, &c. Sleep forbidden.—134–136. The sexes do not exchange clothes, nor is sleep ever forbidden.

Ceremonial uncleanness.—137. The walls of a house are sacred. A chief would not lean against a wall, or indeed enter a house, if he could help it, except his own. It is said that the walls are made unclean by the Maori women hiding in the clefts the cloth polluted by the menses—this is called *kahukahu*, and engenders the *kahukahu* evil spirits mentioned above (see 26). I cannot describe all the possibilities of uncleanness; anything, everything could become *tapu* under certain circumstances and would have to be purified by a *pure* ceremony of some kind. The earth was purified after the Deluge by a sacrifice of seaweed—in ordinary cases by a *pure* of cooking food for the gods, &c., with the priestly incantations.

Doctrine of Souls.—138. They believe that human beings have souls. The word *ata*, “reflected light”—is sometimes used for “soul,” but *wairua*, “spirit,” is the common word. The etymology is obscure. It seems to have signified a shadowy form, but, exactly as with Europeans, there is discrepancy in the ideas. We Englishmen hear ghosts described sometimes as thin misty apparitions, sometimes as gaunt materialistic forms, sometimes as so like the living person that they are mistaken for him, and it is only by the melting away into thin air that the ghostship is recognised. The Maoris too think that dead men have appeared as living ones, but the general notion is that of indistinctness.

139. The soul leaves the body in dreams and trance. In illness the soul journeys away and is sometimes on the brink of crossing to Hades, but returns—only a few return. There is no idea of a happy heaven, so they leave life unwillingly and the soul looks back sorrowfully as it goes. Messages were sent by the dying to other friends gone before. The souls passed from south to north till they came to the extreme north-west point of New Zealand, to *Te Reinga*, the Spirit’s Leap. Here the

soul leaps into the sea or slides down the trunk of a tree, the *pohutukawa* (*Metrasideros tomentosa*). Hence the saying for one dead, "He has slid down the pohutukawa"—and passes to *Po*, Hades. There are several divisions in Hades. (1). *Aotea*, then *te-uranga-o-te-ra*, then *hikutoia*, then *pouturi*, finally *toke*. In each of these the soul seems to lose some of its vitality, till in the last, *toke* (worm), it turns into a worm and then dies altogether. This is one account. Another says that in entering the Hades, or at the *Reinga*, one must cross a river—the Maori Styx. His name is shouted out and food set before him—if he partakes of this food he can never get back. A man named *Te-atarahi* once came back after being dead five days, but he met some of his relations, who warned him not to touch the food. His skin was all wrinkled and loose, but after being purified by incantations he got well. Sometimes the Charon of the death-river drives the spirit back to his friends and he recovers. Two women once had a peep into spirit world, and saw three grey-headed old spirits sitting round a fire; they (the spirits) ran away, and one of the women, desirous of getting some spiritual fire, seized one of the firebrands and was running away, when, just as she was getting clear, a spirit caught her by the heel. She did not like to relinquish her prize, so whirled it into the air and it stuck up into the sky, being what we call the moon. Store houses are generally built north and south so that spirits might not pass over them going to *Reinga*. Spirits were generally clothed in leaves of the *wharangi* (*Melicope ternata*) and *horopito* (*Drimys axillaris*). When on its way the spirit gets to a hill called *wai hokimai*; it strips off its clothes (of leaves) and wails its last lament. Spirits generally made up little bundles of grass and leaves as they went—these are called *tohu*, as "remembrance"; the name of the bundle itself was *whakau*—a green bundle denoted a recent death. It is probable that many of the stories told about *Po* and *Reinga* are the dreams of people in trance through illness. This is the way ordinary souls passed—great heroes went up to heaven and became constellations, or deities—as usual everywhere.

141. They believed that dreams were omens, but I do not think they believed them to be actual occurrences, but the soul had wandered and had seen the things in *Te Reinga*. To dream of wounds, death, bad food, war, drowning, &c., were all evil omens (*aitua*)—singings in the ear, gurglings in the throat, feeling the chill *tokihi-kivi*, the "cold wind of battle"; all these were ominous sleep-warnings.

142. I do not think the friends of a sick man ever tried to restore the soul of a sick man to his body; it was, at all events, uncommon if it happened. They were rather heartless to sick

people, and used to leave them often to die alone—sometimes through sheer hunger.

143. A man's enemies never, as far as I know, attempt to catch and detain the wandering soul, in order that the man, deprived of his soul, may die.

144. They do not think that a man's soul can be extracted or stolen from him, nor that he can lose it by accident.

145. Souls are not driven away by noises, nor can they be bottled up.

148. There is only one instance of transmigration; that is, where the soul (through want of proper death ceremonies) has become malignant, and entered a lizard. This lizard is supposed to gnaw the entrails of a sufferer. I suppose that the lizard is "pain," but lizards are always looked on with dread. In spite of this they were sometimes killed and eaten—some sorts—by freethinkers, I expect.

149. Animals, trees, and plants are not supposed to have souls; nor are they ever treated like human beings, spoken to as intelligent creatures, dressed in human dress, or married to men or women.

150. The heroes and demi-gods took shape as birds, &c., but they did not "talk bird"—they talked Maori. In the fables the lizard and the hawk talk to one another, but I suppose that this is and always was quite transparent, and was never supposed to impress the idea of a bird or mammal or reptile speech.

151. It is only the soul of an offering (of food, &c.) which is accepted by the gods. When the fairies accepted the jewels of *te kanawa*, they only took the souls ("similitudes") of the ornaments; the material jewels were given back to him. Weapons have not souls exactly, but the weapons which have been used in war have the wonderful *mana*—that is, *power, prestige, holiness, intellect, influence*—all these (yet not quite any) describe the word. Some weapons have come down from the gods, and have their genealogies of owners up to *kore* (chaos). The greater feats the weapon had performed, the greater *mana*. I translate *mana* as akin to *skt. manas*, "mind"—and if it does not suit you to say a weapon has a "soul," it has certainly "mind." Sometimes they prophecy, sometimes they shift about; they would kill with their subtle power the inferior person who dared to touch them. It would not exist after the thing was destroyed—it is only what Buddhists call *kama rupa*, not *Buddhi*.

152. The souls of the departed are not exactly worshipped. Maoris hardly have the idea of worship, they are not humble-minded enough to worship. They offered death sacrifices, sacred food for the dead, &c., rather with the idea of "throwing

a sop to Cerberus" in pacifying the evil deities, and also in paying honour to a chief, than from the faintest idea of adoration, &c.

Demons and Spirits.—153. They believe in demons and spirits, but there is not a general division into classes such as nymphs, Dryads, &c. A certain lake might have a spirit, but the next lake none; there was no organization of lake spirits. The fairies were called *patu paiarehe*. They were white-skinned, golden-haired, pretty creatures; but they were dreaded, as sometimes they would carry mortals off. *Turehu* was another name for similar beings. *Mohao* were wild men with great tusks, who decoyed any unwary traveller into the forests and devoured them. *Taniwha* were water monsters generally; they mostly inhabited lakes and streams, but sometimes the sea. Sometimes the beast was a land animal, a lizard, &c., but the true *taniwha* is a water kelpie. In the Taniwha stories I send (from "The Aryan Maori") *pekehana* is the true taniwha, although a sodden beast. Trees, storms, food, &c., were under the control of deities—not regarded as mere spirits. Thus the Lord of Forests was *tane-mahuta*, and Tane was a very great god indeed in Polynesia. *Haere* was a rainbow spirit. *Ponaturi* were elves, little tiny people, mostly dwellers in water and coming ashore to sleep. Then we have *te tini ote hakuturi*, "the multitude of the wood-elves," the little people who put the chips all back into the tree *Rata* had felled and stood it upright again, because he had not paid offering to *Tane*. There is a spirit which is only a voice heard in the surf. There is the *taepo*, a night demon, not very dangerous, but frightening people much. We have real ogres—man-eating, huge, with magical swiftmess.

154. They do not pray or sacrifice to these spirits, except by incantation.

155. And by this means demons or spirits may sometimes be driven away from a house, camp, or village, but there is no periodical expulsion.

Scapegoats.—156. There is nothing resembling the scapegoat.

Guardian Spirits.—158. There are no guardian spirits. Still, each man had his own particular charm (against witchcraft); it is called his "*Kaiwhatu*," and is of course only valuable as giving him the protection of the particular spirit he considered powerful.

159. There is no idea that their life or fortune is bound up with any special object, but the body of another can sicken and be destroyed, thus driving out the soul, by the malpractice of sorcerers procuring a part of some personal belonging (hairs, nails, &c.).

Resurrection.—163. If they do believe in any form of resurrec-

tion it must be a very esoteric doctrine. The deified souls of great heroes are immortal, and they may take human likeness and appear to us—but they are gods. A great chief of god-lineage would share this heaven, but it was always in Polynesia what has been called with admirable sarcasm, “a paradise of the peerage.”

The Heavenly Bodies, &c.—164. Nothing in the form of worship or even homage is paid to the heavenly bodies. The ceremonies for the year-changes seem more propitiations of deities controlling food-planting, &c., than stellar adoration.

165. There are numerous myths about the sky, the earth and the heavenly bodies, but I cannot write them, they are too long. They have been printed already by Grey, White and others.

166. The sun descends at night into *Po*, the underworld—sometimes into *te rua*, “the cave,” but that is only another name for the place of night and death.

167. Thunder (*Whaitiri*), lightning (an emanation from the god *Tawhaki*, *Whaitiri's* grandson), the rainbow (as *kahukura*), earthquake (*ru*), all are deities. Rain is the splashing over of the lake in the heaven called *ngaroto*. Wind is a subject I do not like to speak of with certainty. There is a confusion between *hau*, “wind,” and the Polynesian *hau*, “king”—numberless invocations and ceremonies such as *whangai-hau*, &c., may not be for wind as an element. I must leave it.

168 and 169. There are many myths about animals, plants, &c., but I am too much of a worker to be able to write out many stories.

170. Sacrifices are sometimes offered, rarely human beings or animals; generally worthless things, or food, hair, &c., as belonging to persons, seaweed, fish, &c.

171. I know of one instance of a child being offered up by its father, but generally slaves are the victims.

Miscellaneous Superstitions.—174. They have no superstitions about shadows or reflections in water.

175. Sneezing is met with the usual “God bless you” salutation of “*tihe, mauri ora*,” “Sneeze, living soul!”

176. Maoris hate to be stepped over—it is very rude even now to step over one lying down. Things also were tapued by being stepped across.

177. They kept silence at certain times, being a well-bred and ceremonious people, but there was no long periods of silence such as the Kings of Hawaii laid on their people by proclaiming *Tapu*.

178. The unpremeditated stretching out or stepping out with right hand or foot was accepted as an omen.

179. Footprints, &c., had no particular signification.

180. Séventy was a sacred number for war parties, &c. Most mythical great armies were multiples of seven.

181. There are very many superstitions about animals and plants.

183. They were more cleanly than most savages about excrement. Every house had a (concealed, if possible) privy near, and in large *pa's* a pole was run out over the cliff, to sit on, sailor fashion. I only know one superstitious use of excrement, that wherein the hooks were placed round some before the fishing-party incantations began.

184. Spittle was *tapu*, like hair, &c.

185. They have a great objection to speak their names. Now it is rude to ask a man the name of his wife, &c., still more his own—he is supposed by courtesy to be one so great that he is world-renowned. They had the usual Polynesian dislike to using words containing names of chiefs, &c., and changed the words for others.

186. The names of persons are very commonly changed, especially in remembrance of the death of a child, &c., sometimes in memory of an insult to be avenged.

187. The names of common objects are changed so as not to mention chiefs' names.

MAY 14th, 1889.

Professor FLOWER, C.B., F.R.S., *Vice-President, in the Chair.*

The Minutes of the last meeting were read and signed.

The election of J. ETLINGER, Esq., and of HENRY TUFNELL, Esq., was announced.

The following presents were announced, and thanks voted to the respective donors:—

FOR THE LIBRARY.

From the GENERAL-VERWALTUNG DER KÖNIGLICHEN MUSEEN IN BERLIN.—Veröffentlichungen aus dem königlichen Museum für Völkerkunde. I. Band. I. Heft.

From the AUTHOR.—The Eye of the Adult Imbecile. By Charles A. Oliver, M.D.

- From the AUTHOR.—Description of a case of Coloboma of the Iris, Lens, and Choroid; with a study of the visual fields. By Charles A. Oliver, M.D.
- Double Chorio-Retinitis, with partial degeneration of the Optic Nerve, associated with curious lymph extravasation into the Retina and Vitreous. By Charles A. Oliver, M.D.
- Further Contribution to the study of Consumption among the Indians. By Washington Matthews, M.D., LL.D., U.S.A.
- An Eskimo Strike-a-light from Cape Bathurst, British America. By Walter Hough, Department of Ethnology, U.S. National Museum.
- Ethnographie Précolombienne du Venezuela. Vallées d' Aragua et de Caracas. Par le Dr. G. Marcano.
- From the DEUTSCHE GESELLSCHAFT FÜR ANTHROPOLOGIE, ETHNOLOGIE UND URGESCHICHTE.—Correspondenz-Blatt. 1889. Nr. 3.
- From the BERLIN GESELLSCHAFT FÜR ETHNOLOGIE, ANTHROPOLOGIE UND URGESCHICHTE.—Zeitschrift für Ethnologie. 1888, Heft 6. 1889, Heft 1.
- From the ROYAL SCOTTISH GEOGRAPHICAL SOCIETY.—The Scottish Geographical Magazine. 1889. No. 5.
- From the ROYAL ARCHÆOLOGICAL INSTITUTE.—The Archæological Journal. No. 181.
- From the SOCIÉTÉ ARCHÉOLOGIQUE, AGRAM.—Viestnik hrvatskoga Arkeologičkoga Društva. Godina xi. Broj 2.
- From the SOCIETÀ ITALIANA DI ANTROPOLOGIA, ETNOLOGIA E PSICOLOGIA COMPARATA.—Archivio per l'Antropologia e la Etnologia. Vol. xviii. Fas. 3.
- From the CLUB.—Proceedings of the Berwickshire Naturalists' Club. 1887.
- From the LIBRARY.—Report on the Mitchell Library, Glasgow. 1888.
- From the ASSOCIATION.—Cincinnati Museum Association; Eighth Annual Report for the year ending December 31, 1888.
- From the KAIS.-KÖN. AKADEMIE DER WISSENSCHAFTEN, WIEN.—Sitzungsberichte: philos.-histor. Classe. Band cxvi.; math.-naturw. Classe, I. Abthlg. 1888, No. 1-5; II. Abthlg. A. 1888, No. 1-7; II. Abthlg. B. 1888, No. 1-7; III. Abthlg. 1888, No. 1-6; Almanach, 1888.
- From the ACADEMY.—Bulletin International de l'Académie des Sciences de Cracovie. Comptes Rendus des Séances de l'année 1889.
- From the SOCIETY.—Proceedings of the Royal Society. No. 278.
- Proceedings of the Royal Geographical Society. 1889, May.
- Proceedings of the Society of Biblical Archæology. Vol. xi, Part 6.
- Journal of the Society of Arts. Nos. 1899-1903.
- Transactions of the Royal Society of Victoria. Vol. i. Part 1.
- Bulletin de la Société des Sciences Naturelles de Neuchâtel Tome xvi.

From the SOCIETY.—Boletim da Sociedade de Geographia de Lisboa.

7a Serie, Nos. 11, 12.

From the EDITOR.—*Nature.* Nos. 1015-1019.

— *Science.* Nos. 422-325.

— *Revue Scientifique.* 1889. Nos. 15-19.

Mr. G. M. ATKINSON exhibited a remarkable form of Celt obtained from a native on the Essequibo River, Dutch Guiana, by W. S. Turner, Esq., of Georgetown, Demerara, who presented it to A. G. Geoghegan, Esq., in July, 1888.

Mr. ARTHUR THOMSON exhibited an articulated skeleton and several skulls of Veddahs, and read the following Paper:—

On the OSTEOLOGY of the VEDDAHs of CEYLON.

By ARTHUR THOMSON, M.A., M.B.

ALL the information regarding the Osteology of the Veddahs or Weddo of Ceylon has hitherto been confined to a description of the crania of that people.

The skeleton of an adult male Veddah, aged 26, has been recently added to the ethnological collection at Oxford which already contains several specimens of Veddah skulls. It had been the intention of the late Professor Rolleston to have described the latter, and in his papers, now in the possession of the University, there are many notes relating to them; unfortunately I have not been able to make much use of these, as they are very fragmentary and scattered, but I have found them of much service in identifying the locality and sex of the several specimens, as proved by the letters of the different donors.

I propose making the description of the above specimens the subject of the present inquiry.

The literature of the subject is limited, with one or two exceptions, to a mere description of the appearances of this race, and very few measurements of their proportions are recorded. Percival,¹ Cordiner,² Knox,³ Davy,⁴ Pridham,⁵ and Stirr⁶, in their respective works on Ceylon all refer to the Veddahs.

¹ "Description of the Island of Ceylon." London, 1805.

² "Description of Ceylon." London, 1807.

³ "Historical Account of the Island of Ceylon." London, 1817.

⁴ "Ceylon and its Inhabitants." London, 1821; and *Researches Anatomical and Physiological.* John Davy, 1839, vol. i, p. 177.

⁵ "Ceylon." C. Pridham. London, 1849.

⁶ "Ceylon and the Singhalese." London, 1850.

More recently Tennent,¹ Baily,² Rolleston,³ and Hartshorne,⁴ have described at some length the physical appearances and habits of these people. By far the most elaborate monograph on the subject is that by Professor Virchow,⁵ who has collected most of the information on the subject up to the date of publication. Further reference may be made to the standard works of Pritchard,⁶ Tylor,⁷ and Lubbock,⁸ whilst for the description of measurement of numerous skulls the Catalogue of the Human Crania, in the collection of the Royal College of Surgeons of England, by Professor Flower, and the "Thesaurus Craniorum" of Dr. Barnard Davis may be consulted.

The skeleton to be presently described was purchased from the Anthropological Society of Bombay. It is stated to be that of a male Rock Veddah, and was obtained by Mr. C. V. Stevens, who spent some months in 1886 among these interesting people on the eastern side of the Island of Ceylon. Mr. Stevens brought back three skeletons of pure Veddahs, which were purchased by the Anthropological Society of Bombay, of which the present specimen is one.

The age of the skeleton is said to be 26, and in many respects this is borne out by the condition of the skull. The ossification of the long bones, however, seems to have been delayed so that we have epiphyses separable at an age at which we would naturally have expected to find them fused.

Skeleton.

For the sake of uniformity the measurements adopted are those employed by Sir William Turner in his monograph on the Human Skeletons, published in the Challenger Reports,⁹ and reference is made to that work for information on the methods adopted.

As considerable importance now attaches to the pelvis, it has been taken first in the series of measurements.

After articulation, the greatest diameter between the iliac crests was found to be 230 mm. Its height, as measured from the highest point of iliac crest to the most dependent part of

¹ "Ceylon." London, 1859.

² "Transactions of Ethnological Society." New Series. Vol. ii, 1863, p. 279.

³ "Transactions of British Association," 1872, p. 194. Scientific Papers and Addresses. Rolleston. Vol. i, p. 161.

⁴ "Fortnightly Review." London, 1876. New Series. Vol. xix, p. 406.

⁵ "Ueber die Weddas von Ceylon und ihre Beziehungen zu den Nachbarstämmen." Academia Berolinensis Classica Physica. 1881.

⁶ "Natural History of Man."

⁷ "Primitive Culture." London, 1871, vol. i, p. 45.

⁸ "Prehistoric Times."

⁹ "Challenger Reports," vol. xvi.

the ischial tuberosity, equals 188 mm. 178 mm. is the distance between the anterior superior iliac spines, that between the posterior superior iliac spines is 62 mm. The greatest width between the outer borders of the ischial tuberosities is 93 mm., and the tips of the ischial spines are distant 56 mm. from each other. The vertical and transverse diameters of the acetabulum are equal, and measure 49 mm. respectively. The obturator foramen is 48 mm. in its vertical diameter and 30 mm. in its transverse, yielding an index of 62.5.

The sub-public angle is extremely narrow; it measures 55°.

The angles of a Hindoo and a Sikh, measured by Turner, are 57° and 62° degrees respectively.

With regard to the dimensions of the cavity of the true pelvis, we find the greatest transverse diameter of the inlet equals 99 mm. This is exceeded by the conjugate or antero-posterior diameter, which measures 102 mm. From these measurements

the pelvic index is computed as follows:—
$$\frac{\text{Conjugate} \times 100}{\text{Transverse}} = 103.$$

The oblique diameters, taken from the sacro-iliac joints to the ilio-pectineal line opposite the ilio-pectineal eminences, do not differ, 99 mm. being the measurement on either side.

The distance from the middle of the body of the fifth sacral vertebra to the lower border of the pubic symphysis, called the inferior sagittal diameter, measures 109 mm. The coccygeo-pubic diameter could not be measured, as the coccyx is wanting. The width between the inner borders of the ischial tuberosities, taken from points just below the lesser sciatic notches, equals 77 mm. 32 mm. is the measurement from the upper to the lower border of the pubic symphysis. The depth of the true pelvis is gauged by measuring the distance from the brim near the pectineal eminence to the most dependent part of the ischial tuberosity; this equals 91 mm.

The following are the measurements of the individual bones. The height length of the ilium equals 115 mm., its breadth, 129 mm., yielding an iliac index of 112.

The breadth of the innominate bone is taken from the posterior superior iliac spine to the upper end of the pubic symphysis; this measures 158 mm. The length of the pubis is 57 mm. The pubo-innominate index obtained thus:—

$$\frac{\text{Pubic length} \times 100}{\text{Innominate breadth}} = 36.$$

Length of ischium equals 81 mm. The innominate index is obtained by use of the following formula—

$$\frac{\text{Breadth of innominate} \times 100}{\text{Height of pelvis}} = 82.7.$$

The height of pelvis is equal to the ischio-iliac diameter when taken in a straight line. To obtain the ischioin-nominate index

$$\text{the formula is—} \frac{\text{Ischial length} \times 100}{\text{Pelvic height}} = 42.4.$$

There is unfortunately much diversity in the methods of measuring the pelvis. The above have been adopted both for the sake of uniformity, and also because Sir William Turner's paper embodies the most recent results.

In regard to the breadth-height index it may be well to remind the reader that when the index is high it indicates that the pelvis is relatively high compared to its breadth, and conversely when the index is low it expresses a pelvis broad in relation to its height. Verneau¹ quoted from Turner, gives the mean measurements of 63 European pelves as 220 mm. high and 279 mm. wide, yielding an index about 79. From this it will be seen that the present specimen, with an index of 81, is relatively high compared to its width. In regard to the pelvic index, a high index shows that the pelvis possesses a conjugate diameter greater than the transverse, a low index that the transverse diameter exceeds the conjugate. To the former group Turner has applied the term *dolichopellic*, to the latter, *platypellic*. Europeans generally are *platypellic*, and in the *dolichopellic* group, which includes those with an index above 95, are to be found Australians, Bushmen, Hottentots, Kaffirs, Andamans, and Malays. The index in the present instance is 103, and naturally falls within this group.

Sacrum.

The sacrum, anteriorly, is flat above and tilted forward below, presenting almost a feminine appearance. The deepest part of its curve, on a level with the centre of the third segment, lies 10 mm. behind a line drawn from the centre of the promontory to the centre of the lower border of the fifth vertebra. The bodies and lateral masses of the first three segments are not completely fused together.

It measures in length 101 mm., width 103 mm., yielding an index of 98. The term *dolichohieric* is applied to that group with sacral indices below 100, and includes Australians, Kaffirs, Andamans, Malays, and Chinese.

¹ "Le Bassin dans les Sexes et dans les Races." Paris, 1875.

Spinal Column.

The vertebrae, like other parts of the skeleton, are not completely ossified; the epiphysal plates on the bodies are wanting in most instances, and, where present, are only fragmentary. The epiphyses at the extremities of the sixth and seventh cervical spines are wanting. In most instances the neuro-cential suture is visible on the upper and under aspects of the bodies of the vertebrae.

The column, including the cervical, dorsal, and lumbar vertebrae, closely strung together and then laid on a horizontal plane, measured 42.5 cm.

The vertebrae are small.

The transverse diameter of the under surface of the body of the fifth lumbar = 42 mm.

The transverse diameter of the fourth dorsal vertebra (the narrowest) = 22 mm.

The transverse diameter between the tips of the transverse processes of the atlas = 68 mm.

Cervical Region.

In this region the spines of the second, third, fourth, and fifth are bifid. The sixth is tuberculated, but the small epiphyses are wanting; it approached nearly in length to the spine of the seventh, the epiphysis of which is also absent.

The vertebra-arterial foramen is absent in the transverse processes of the seventh cervical vertebra. In this situation a pair of cervical ribs is developed.

The foramen is very small in the right transverse process of the sixth. On the left side it is normal, as throughout the remainder of the series. The cervical ribs present show a small head, which articulates with a little tubercle on the side and upper part of the body of the seventh cervical vertebra. A slender neck stretches outward to join a well-developed tubercle, which articulates by means of a facet 7 mm. in diameter, with a corresponding surface on the transverse process. The shaft of the rib is represented by a stunted process about 9 mm. in length. The entire length of these supernumerary ribs measures about 25 mm.

Dorsal Region.

The ninth dorsal vertebra has two demi-facets. The tenth, one-half facet only. There is no indication of facets on the transverse processes of this vertebra, nor are there articular surfaces on the tubercles of the tenth ribs.

On the left side of the eighth and ninth dorsal vertebræ there are little articular tubercles situated on the pedicles in line with the articular processes; these articulate with corresponding surfaces on the eighth and ninth ribs of that side. There is no articular facet visible on the transverse process of the ninth vertebra. Otherwise the arrangement is normal.

The mammillary processes are well-developed on the twelfth, and evident enough on the eleventh. That on the left side of the tenth curves over the inferior articular process of the ninth, so that the two vertebræ are interlocked.

In other respects this series of vertebræ is normal. It may be noted, however, that the small epiphyses on the spines are absent.

Lumbar Vertebræ.

The mammillary and accessory tubercles do not present any unusual development. Employing the measurements described by Cunningham in his memoir on the "Lumbar Curve in Man,"¹ the indices of the vertebral bodies are as follows:—

Lumbar Vertebræ.	Anterior Depth.	Posterior Depth.	Index.
	mm.	mm.	
I.	19	21	110·5
II.	20	23	115
III.	22	23	104·5
IV.	21	20	95·2
V.	20	20	100

A reference to the above will show at once that the centra of the upper three vertebræ are thicker behind than in front. The lumbo-vertebral index is obtained thus—

$$\frac{\text{Sum of posterior measurements} \times 100}{\text{Sum of anterior measurements}} = 104·9.$$

A result which displays the tendency of the vertebræ in this region to arrange themselves in a curve, the concavity of which is directed forward. To such a condition Turner² has applied the term *koilorachic*, as opposed to the conditions in which the column approaches the straight (*orthorachic*), or that in which the convexity is directed forward (*kurtorachic*).

Another point of interest to which Cunningham has drawn

¹ "Royal Irish Academy." Cunningham Memoirs, No. II.

² "Challenger Reports," vol. xvi. "Report on the Bones of the Human Skeleton," p. 73.

attention is the fact that in the lower races of man, the fifth lumbar vertebra has not that well-marked wedge-shaped appearance so characteristic of the higher races. He attributes this to the variation in the backward sweep of the sacrum and a consequent difference in the pelvic inclination.

In the skeleton at present under examination, a reference to the measurements of the fifth lumbar vertebra tends to prove the correctness of Cunningham's observations.

Sternum.

The presternum and the second and third segments of the mesosternum are alone present. The presternum measures 49 mm. vertically, 54 mm. transversely. The second and third segments of the mesosternum are fused together, their combined length equals 59 mm; greatest width, 25 mm. The lower border of the third segment is notched as if there had existed a foramen between the third and fourth segments. Broca¹ has drawn attention to the fact that in the lower races of man there is a tendency for the segments of the sternum to remain separate in the adult condition. In the anthropoid apes, with the exception of the gibbon, we find this normally the case.

Ribs.

All the ribs are present; the longest are the sixth, which, measured from head to tip along their outer curve, = 275 mm.; from the anterior margin of the articular facet on the head to the inner border of the sternal end in a straight line measures 159 mm. The cervical ribs have been already described.

Clavicles.

The clavicles, which are slender bones, differed in length; the left, the longer, measures 132 mm., the right 122 mm. The muscular impressions on the left are slightly more pronounced. The right has strong impressions for the costo-clavicular and coraco-clavicular ligaments; these are scarcely, if at all, evident on the left bone.

The curves of the bones are slight. A comparison of these curves, obtained by making tracings on tracing paper, and then superposing, one reversed over the other, showed no perceptible difference. The difference in the length of the clavicles may be perhaps explained by the employment of the left arm in the use of the bow, of which Davy² remarks: "The influence of

¹ "Bull de la Soc. d'Anthr." Paris. February, 1878.

² "Researches Anatomical and Physiological." John Davy, 1839, vol. i, p. 177.

habitual exercise in strengthening any particular set of muscles is remarkably illustrated in the Vaida. I saw one, a young man of a diminutive and spare form, with slender arms and shoulders, use with the greatest ease a bow he had been accustomed to, which one of the strongest of our soldiers could hardly bend."

Similarly Hartshorne¹ says: "But notwithstanding their small size and their slight physique, the strength which they possess in the arms, and especially in the left, is remarkable. It is probable that this is due to their constant use of the bow, upon which they chiefly depend for their supply of food. It is about 6 feet long, and has generally a pull of from 45 or 48 to about 56 pounds. It therefore requires no ordinary strength to draw the arrow, which is 3 feet 6 inches in length, up to the end. . . . One of them (Latty) was able to hold his bow, drawn to its full length, for upwards of two minutes, without the slightest tremor of the left arm."

Scapulæ.

The scapulæ are small and slender. The acromial epiphyses are still separate. The epiphyses along the vertebral border are absent except at the lower part on the right side.

The superior border is thin and sharp, falciform in outline, with no trace of a suprascapular notch or foramen. The vertical length is 135 mm., the width 96 mm. The scapular index, 71.1, is high; this indicates a proportionate increase in the breadth of the bone, and differs widely from that of European specimens, the average index of which, according to Broca, is 65.9, according to Garson, 65.2.

In this respect it more nearly approaches the averages given by Turner—100 Negroes, 69.7; 27 Andamans, 70.2; 26 Melanesians, 69.8; 16 Hindoo and Sikhs, 68.5; 10 Malay, 68.9. The infraspinous index, 98, is also high, and in this character it is most closely associated with the races above mentioned. In another respect the bones closely resemble those of the Andaman. Professor Flower² has pointed out that in the latter race a distinct suprascapular notch is very rare, and he only records three instances of its presence. As before noted the superior border of the scapula is thin and falciform in outline, with no trace of a notch or foramen. In other two specimens belonging to the collection of the Royal College of Surgeons, which I had an opportunity of examining, I found the scapulæ of No. 680A, one notched, the other with an even superior border; in 680B

¹ "Fortnightly Review," vol. xix. New Series. 1876, p. 407.

² "On the Osteology and Affinities of the Natives of the Andaman Islands." "Journ. Anthr. Inst." November. 1879.

both scapulæ were notched. The scapular indices have been given as above, notwithstanding the fact that the epiphyses along the vertebral border are wanting. It appears that these epiphyses have little influence in moulding the general form of the bone. In the Ungulata they remain permanently cartilaginous, and in man, when present, they do not so materially increase the width of the bone as to render measurements without them entirely devoid of value; moreover, as will be seen above, the scapulæ are relatively broad even disregarding these epiphyses.

Shaft of the Upper Extremity.

Humeri.—323 mm. in length; are long and slender. The superior epiphyses are not yet fully united to the shaft. The extremities are small compared to the length of the shaft; the circumference of the articular part of head is 120 mm.; the greatest intercondyloid width 57 mm. The outer bicipital ridge and the deltoid impression are well-marked.

Radii.—These bones are slender and little curved. The inferior epiphyses are still separate. Maximum length (including styloid) = 253 mm. on the right side, 251 mm. on the left. Muscular impressions feebly marked, extremities small; greatest transverse diameter of inferior extremity is 26 mm.

Radio-Humeral Index, 78.3.

Ulnæ.—Slender and more curved than usual, rendering the posterior border very prominent. Maximum length—right 271 mm., left 268 mm. The inferior epiphyses are still separate. The extremities are small.

Manus.—The bones of both hands are complete. The carpi are small. The length of the hand measured—after articulation—from the centre of the radial surface of the semilunar to the tip of the ungual phalanx of the middle finger, the right 175 mm., the left 176 mm.

Shaft of the Inferior Extremity.

Femora.—These bones differ slightly in length. The maximum oblique length of right is 466 mm., left 470 mm. The length from the condyles to the tip of the trochanter in the oblique position is 444 mm. on the right, 451 mm. on the left. As is the case with the other long bones, the characteristic appearance is due to the long and slender shafts and small extremities. The greatest intercondyloid width is 67 mm. The circumference of the articular head measures 130 mm. The shaft, which is compressed and flattened in its upper fourth, presents a double curve—the upper corresponds to the upper

fourth of the shaft and the trochanters, and is concave anteriorly. The lower curve is general throughout the remainder of the bone, and is convex anteriorly. The shaft is also twisted in the upper part, so that the anterior surface of the bone is directed outwards and forwards, thus causing the general mass of the trochanter to be placed further back than usual, with a corresponding rotation of the head and neck forward. The inner border of the shaft is prominent above, and between it and the trochanter minor there is a well-marked groove. The lineæ asperæ are well pronounced, and in the middle thirds of the bones form outstanding ridges. The impressions for the Glutei maximi are strongly marked. The spiral line is hardly distinguishable. The inferior epiphyses are separate.

Tibiæ.—These bones are of unequal length; the right measures 395, the left 399 mm.; they are remarkable for their proportionately great length and the small size of the extremities. The greatest width at the condyles is 63 mm. The surface for articulation with the head of the fibula is indistinct. The superior epiphyses are not completely fused with the shaft. The shaft is much curved anteriorly; the most prominent point of the curve, opposite the junction of the middle with the upper third of the shaft, is situate 16 mm. in front of a straight line drawn from the anterior margin of the upper extremity to the anterior margin of the lower extremity. The shin is correspondingly prominent. The transverse diameter of the shaft, taken at the level of the nutrient foramen, measures 24 mm. on the right, 22 mm. on the left. The antero-posterior diameter, taken at the same level, is 31 mm. on the right, 30 mm. on the left. The indices of platycnemia derived from these are 77·4 for the right and 73·3 for the left tibia respectively. The inferior extremity is but little expanded; its greatest width is 44 mm.

On the anterior borders of the lower extremities of both tibiæ there are semilunar facets measuring 13 mm. long by 7 mm. wide. These surfaces, which are placed rather towards the fibular side, are for articulation, with corresponding surfaces on the necks of the astragali, and come in contact with these latter in extreme dorsi-flexion of the foot. The tibio-femoral index is 84·8; the intermembral index, 66·2; and the femoro-humeral index is 68·7.

Fibulæ.—These are stout bones contrasted with the slender femora and tibiæ. The extremities are small. Maximum length—right 381 mm., left 384 mm.

Patellæ.—Small; 34 mm. wide, 36 mm. long.

Pedes.—The skeletons of both feet are complete. After articulation the foot measures from the most prominent point of the os calcis to the tip of the ungual phalanx of the second toe, on the

right side, 212 mm., on the left 210 mm. The length of the second toe exceeds that of the great toe by 2 mm.

The tarsus presents no peculiarity other than that to which I have referred, viz., the presence of a facet on the neck of the astragalus which articulates, with a corresponding facet on the lower end of the tibia. A similar condition exists on both sides.¹

There is a well-marked tubercle posteriorly, which is probably developed from a separate centre, as sometimes happens; and the articular surface on the under surface for contact with the sustentaculum is more extensive; indeed, the surfaces are such as to lead us to suppose that a somewhat freer range of movement existed between the astragalus and os calcis, a fact no doubt associated with the habits of this individual.

The maximum length of the third metatarsal equals that of the second, viz., 70 mm.

I have had the opportunity, thanks to the kindness and courtesy of Professor Charles Stewart, of examining two imperfect skeletons of Veddahs in the possession of the Royal College of Surgeons.

Specimen No. 680A was that of an adult male from Appua. The long bones are characterized by their great length and slender appearance. In this respect they closely resembled the Oxford specimen, particularly the tibiæ, which are similarly curved and possess small upper extremities. On the anterior border of the inferior extremity there is a slight appearance of a facet for the astragalus, but the latter bone on neither side shows a corresponding facet.

The scapulæ are imperfect; the superior border of one is slightly notched, the other is falciform. The ulnæ are curved, as in the Oxford specimens.

No. 680B. The same remarks apply to this specimen. The bones are those of a young male, and the epiphyses are not united. The measurements appended are therefore only approximate. On the anterior border of the right inferior tibial epiphysis there is a facet for the neck of the astragalus, and on the necks of both astragali corresponding facets are present. The scapulæ are small, the upper borders notched. In both humeri the olecranon fossæ are perforated. The ulnæ are curved.

In the collection of Dr. Barnard Davis there is the humerus and femur of a Veddah, of which the measurements are given.

Subjoined is a table of the measurements of the skeletons.

¹ A similar arrangement of facets has been noted in many instances in savage and prehistoric races. See Arthur Thomson on the "Influence of Posture on the form of the articular surfaces of the Tibia and Astragalus in the Different Races of Man and the higher Apes." "Journal of Anatomy and Physiology," vol xxiii, p. 616.

MEASUREMENTS OF PELVIS OF OXFORD SKELETON.

External Dimensions		Dimensions of Cavity of true Pelvis.		Dimensions of Individual Bones.	
	mm.		mm.		mm.
Breadth of Pelvis...	230	Transverse Diameter ...	99	Height of Ilium...	115
Height of Pelvis ...	188	Conjugate Diameter ...	102	Breadth of Ilium ...	129
Breadth - Height Index ...	81.7	Pelvic Index ...	103	Iliac Index ...	112
Breadth between—		Oblique Diameter { right ...	99	Breadth of Innominate Bone ...	158
Ant. Sup. Spines ...	62	left ...	99	Length of Os Pubis ...	57
Post. Sup. Spines ...	93	Inferior Sagittal Diameter ...	109	Pubo - Innominate Index ...	36
Ischial tuberosities ...	56	Coccygeo-Pubic ...		Length of Ischium ...	81
" spines ...		Intertuberal Diameter ...	77	Innominate Index ...	82.7
G-diameter of Cotyloid cavity ...	49	Depth of Pubic Symphysis ...	32	Ischio Innominate Index ...	12.1
Vertical of Obturator Foramen ...	48	Depth of Pelvic Cavity ...	91	Length of Sacrum ...	101
Transverse of Obturator Foramen ...	30			Breadth of Sacrum ...	103
Obturator Index ...	62.5			Sacral Index ...	98
Subpubic Angle ...	55				

						Oxford Skeleton.	R.C.S.		B. Davis' Collection.
							680A	680B	
Clavicles—									
Length { right						122			
left						132			
Scapulæ—									
Vertical length { right						135			
left						135			
Width { right						96			
left						96			
Scapular Index						71.1			
Infraspinous Index						98			
Humeri—									
Maximum length { right						323	285	277	304
left						323	282	278	
Radii—									
Maximum length { right						253	225	226	
(including styloid) { left						251	232		
Radio-Humeral Index						78.3	78.9	81.5	
Ulnæ—									
Maximum length { right						271			
(including styloid) { left						268			
Femora—									
Maximum length in oblique position { right						466	414	415	436
left						470	414	412	

						Oxford Skeleton.	R.C.S.		B. Davis' Collection.
							680A	680B	
Tibiae—									
Length, not including spine { right						395	350	354
or maleolus { left						399	350	350
Tibio-Femoral Index....						84.8	84.5	85.3
Intermembral Index....						66.2	66.7	65.4
Femoro-Humeral Index						68.7	68.8	66.7
Fibulae—									
Maximum length { right						381		
{ left	384		
Pes—									
Length { right						212		
{ left						210		

The skeleton, having been carefully articulated under the direction of Mr. Charles Robertson, was found to measure 5 feet 2½ inches, or 1,578 mm. The descriptions of different observers vary much in detail but agree fairly as regards stature. Davy¹, in speaking of the Village Veddahs, to whom the Rock Forest or Wild Veddahs are closely allied, describes them as generally small, 5 feet 3 inches to 5 feet 5 inches, slender, muscular and well-made. Tennent² writes of the Village Veddahs "as miserable objects, active but timid, and athletic, though deformed, with large heads and misshapen limbs." Forbes³ thus pictures them: "And such of them (the Veddahs) as I have seen do not in any respect differ from what other natives would become if compelled to use the same exertions, to endure the same privations, and, like them, to live as wanderers in a forest wilderness."

Percival⁴ notes them as being "remarkably well-made." Pridham, quoted from Virchow⁵, says, "They are not more than 5 feet 2 inches in height, their hands small, but their feet were long and flat."

Gillings, quoted from the same authority, describes them (the Veddahs) as "mostly low in stature, but some of them are strong, active men."

Baily⁶ delineates them as "short, more slightly built, yet very

¹ *Loc. cit.*

² *Loc. cit.* Vol. ii, p. 449.

³ "Eleven Years in Ceylon." Vol. ii, p. 76.

⁴ "An Account of the Island of Ceylon." London, 1805, p. 283.

⁵ *Loc. cit.*, p. 41.

⁶ "Transactions Ethnological Society." New Series. Vol. ii. 1863, p. 278.

active, though far from being muscular, their limbs are firmly knit together, and they are athletic, and capable of enduring great fatigue. Though spare they are generally in good condition, and look more healthy than many of the Singhalese."

He gives the following measurements:—The tallest male from Bintenne he measured was 5 feet 3 inches, the shortest 4 feet 1 inch. Average male height from 4 feet 6 inches to 5 feet 1 inch. Average female height, 4 feet 4 inch to 4 feet 8 inches.

Of 14 male Veddahs from Bintenne the tallest measured 5 feet $3\frac{1}{6}$ inches, the shortest 4 feet $6\frac{1}{4}$ inches; the average equalled 5 feet $\frac{1}{2}$ inch. Of 12 females the tallest was 5 feet $2\frac{1}{2}$ inches, the smallest 4 feet $4\frac{1}{2}$ inches, the average 4 feet 9 inches.

To Hartshorne¹ we are indebted for fuller details as regards their proportions. The tallest specimen he met with measured 5 feet $4\frac{3}{4}$ inches. He gives the height of Latty, age about 18, as 5 feet $4\frac{1}{4}$ inches, and Bandiey, age about 25, as 4 feet $11\frac{3}{4}$ inches. Of these latter he gives further measurements.

	Latty.		Bandiey.	
	ft. in.	mm.	ft. in.	mm.
Height	5 4 $\frac{1}{4}$ or	1631·91	4 11 $\frac{3}{4}$ or	1517·59
From top of forehead to bottom of chin	0 6 $\frac{3}{8}$ or	168·25	0 7 or	177·80
Across face	0 5 $\frac{1}{4}$ or	133·34	0 6 $\frac{1}{4}$ or	171·42
Shoulder to elbow	0 11 or	279·39	0 12 $\frac{3}{4}$ or	323·81
From elbow to wrist	0 10 or	254·0	0 8 $\frac{1}{2}$ or	19·05
On to end of middle finger....	0 7 $\frac{3}{4}$ or	196·82	0 6 $\frac{1}{2}$ or	174·59
Round biceps of right arm....	0 10 $\frac{1}{4}$ or	260·34	0 9 $\frac{1}{2}$ or	241·28
" " left arm	0 10 $\frac{3}{8}$ or	263·51	0 9 $\frac{1}{2}$ or	241·28
Round muscle of right forearm	0 8 $\frac{3}{8}$ or	222·22	0 8 $\frac{3}{8}$ or	222·22
" " left forearm	0 8 $\frac{3}{8}$ or	222·22	0 8 $\frac{3}{8}$ or	222·22
Round chest....	0 31 or	787·39	0 29 $\frac{1}{2}$ or	749·27
Length of thigh	0 16 $\frac{3}{8}$ or	425·41	0 16 $\frac{1}{4}$ or	419·37
From knee to ankle....	0 16 $\frac{1}{4}$ or	412·73	0 15 $\frac{1}{4}$ or	393·67
Calf of leg in girth	0 11 $\frac{1}{2}$ or	298·41	0 11 $\frac{1}{2}$ or	292·07
Sole of foot	0 9 $\frac{1}{2}$ or	241·28	0 8 $\frac{3}{8}$ or	222·22
Round head at middle of forehead	0 20 $\frac{1}{4}$ or	514·33	0 20 $\frac{1}{4}$ or	514·33

From the foregoing measurements of height Virchow² arrives at the following averages:—Males, 1,537 mm., females 1,448 mm., and concludes that the Veddahs are allied to small not to say pigmy races.

With regard to the measurements of Latty and Bandiey given above, their utility is sadly impaired by the absence of details as to the methods employed and the points taken. Moreover, as Virchow has pointed out, errors appear to have crept in; in proof

¹ "Fortnightly Review." Vol. xix. New Series. 1876, p. 408.

² *Loc. cit.*, p. 42.

whereof he points out that the measurement of the distance from shoulder to elbow in the smaller man exceeds by 44 mm. the same length in the taller man, whilst the entire length of the arm of the short man is less by 13 mm. than that of the taller individual. He also criticises in a similar manner the measurements across the face.

In regard to the question of stature it must not be forgotten that many of the so-called aborigines of Southern India, whose claim to be so described is disputed by Crawford, are no taller, if as tall, as the average Veddah, so that in this respect we cannot claim any unusual distinction for the aborigines of Ceylon.

As regards the relative proportions of the different members to the body height, we have unfortunately little material to work on. In the Oxford skeleton only can we arrive at any definite statement of the proportions of the limbs to the height, and here we are apparently dealing with an individual variation, for the length of the tibiae is quite unusual.

The length of the femur is relatively great. Taking the height at 1,578 mm., its proportion to the skeleton is as 29.5 is to 100.

In the case of the other long bones of which we have measurements at our disposal we have unfortunately no knowledge of the height of the individuals to which they belonged. The males vary from 4 feet 1 inch to 5 feet 4½ inches. Assuming the average to be 1,537 mm., as Virchow has stated, we shall have to deduct 35 mm. as allowance for soft parts before we can compare the lengths of the femora with the height of skeleton.

In both the specimens at the College of Surgeons the proportion is as 27.6 to 100; No. 680B, however, is the skeleton of a youth. The femur in the possession of Dr. Davis bears the proportion to the average height of *skeleton* (1,500 mm.) of 29 to 100.

Topinard¹ gives the proportion of the femur to the height as 27.1 in Europeans; 4 blacks of India, 27.8; 3 Australians 27.6; 32 African negroes, 27.9.

This excessive length of thigh in the Veddah is confirmed by an inspection of the photographs sent to Professor Rolleston by Mr. Hartshorne. Nor does it appear that this peculiarity is confined to these people alone, for the same condition appears to hold good in many of the aborigines of India, as proved by approximate measurements made from the photographic illustrations of the people of India,² especially those of the Coromandel Coast.

Unfortunately we cannot make much use of the measurements

¹ "Elements d'Anthropologie Générale." Paris, 1885, p. 1041.

² "People of India." Watson and Kaye.

of Latty and Bandiey given by Hartshorne in the *Fortnightly Review*, as we have no data as to the points taken. It may be noted, however, that whilst there is a difference of $4\frac{3}{4}$ inches between the height of the two men, the length of the thighs only differs by $\frac{1}{4}$ inch.

	Humerus, length.		Radius, length.		Radio- Humeral Index.	Femur, length.		Tibia, length.		Tibio- Femoral Index.	Inter- Membral Index.	Femoro- Humeral Index I.
	r.	l.	r.	l.		r.	l.	r.	l.			
Oxford ...	323	323	253	251	78.3	466	470	395	399	84.8	66.2	68.7
B. Davis ...	394	...	...	...	...	436	...	...	...	...	...	...
R.C.S., 680A ...	285	282	225	232	78.9	414	414	350	350	84.5	66.7	68.8
R.C.S., 680B ...	277	278	226	...	81.5	415	412	354	350	85.3	65.4	66.7
Average ...	...	...	...	...	79.5	...	...	...	...	84.8	66.1	68.0

In regard to the radio-humeral index, the average of the three skeletons, as above, yields an index of 79.5. Topinard¹ gives the average of thirty-two African negroes as 79.0, Tasmanians next with an average of 78.7. Four Hindoos yield a mean of 77.2, whilst the average of 85 articulated European skeletons is 72.5. The above figures are therefore in accord with the statement that in the black races generally the antebrachial index is high, and that the relative length of the radius to the humerus is great, a character in which they resemble the anthropoids.

In like manner the tibio-femoral index of the three Veddahs is 84.8, agreeing with the statement² that in the black races the index is high. The relatively great length of the tibia has been already referred to in the foregoing description. Adopting the nomenclature suggested by Turner³ the skeletons are Mesatikerkic and Dolichonemic. In regard to the intermembral index given above, 66.1, it is lower than the average European, which Turner⁴ quotes as 69.5. The index of a Sikh given by B. Davis is 65.8, whilst that of a Malay measured by Turner is 67.7. A low index points to a relatively shorter upper limb. In the black races the humerus is usually relatively shorter than the femur, as indicated by a low femoro-humeral index. 72.5 is the mean of Europeans. The index of the three Veddahs is 68.

Malays and natives of India generally have a low femoro-humeral index. Broca⁵ has described two skeletons of Mara-

¹ "Éléments d'Anthropologie Générale." Paris, 1885, p. 1043.

² *Loc. cit.*, p. 1046.

³ "Report on Human Skeletons," "Challenger Reports," vol. xvi.

⁴ *Loc. cit.*, p. 509.

⁵ "Squelette Hindous." Bull de la Soc. d'Anthr. February, 1878.

vars, between which and the foregoing there are certain points of agreement. The antibrachial index of his male is 80, of his female skeleton, 81.1; in stature, both are small. The male measures 1,475, the female 1,537 mm.

Proportions of the Head and Trunk.—The distance, measured in the Oxford skeleton after articulation, from the seventh cervical spine to the lower border of the fifth sacral segment equals 459 mm. From the level of the vertex above to the same point below equals 669 mm. The proportion of the trunk to the height is as 29 is to 100.

As peculiarities in the skeletons may be noticed the foramina in the olecranon fossæ of the humeri of No. 680B. Reference has been already made to the question of greater development of the left as compared to the right arm. Authors have attempted to explain this by the use of the bow, but whilst the extensors might be more largely developed in the left arm one would naturally expect a corresponding increase in the flexors of the right arm, the muscles brought into play in drawing back the arrow. Hartshorne¹ alludes to another peculiarity he observed, viz., "their sharply pointed elbows." There is nothing in the formation of any of the bones I have examined to explain this appearance.

The same author makes a statement to the effect that the Veddahs are characterised by "the comparative shortness of their thumbs." With the object of testing this I have measured the lengths of the thumbs and fingers, including the metacarpals and phalanges, the points taken being from the centre of the dorsal margin of the base of the metacarpal bone to the tip of the ungual phalanx. The measurements are:—

	Right hand.	Left hand.
Thumb	95 m.m.	95 m.m.
Index finger	141 "	140 "
Middle "	149 "	148 "
Ring "	137 "	138 "
Little "	112 "	111 "

As will be seen from these figures, there is no evidence to confirm the above statement.

In regard to the length of the hand, Mugnier² has pointed out

¹ *Loc. cit.*, p. 409.

² "La main et la taille d'Indigènes Asiatiques." *Mem. de la Soc. d'Anthr.* Paris. 2^e Serie, tome iii.

that the absolute length of the hand in the Asiatics he measured is always less than that of Europeans.

The tibiæ are very remarkable not only in regard to length, but also in the peculiarity of their form. They are not platycnemic as their indices show.

The measurement of the various tibiæ examined, taken at the level of the nutrient foramen, is as follows:—

				Transverse Diameter.	Antero- Posterior Diameter.	Index of Platycnemia.
				mm.	mm.	mm.
Oxford specimen	{	right ....	....	24	31	77·4
		left ....	....	22	30	73·3
Royal College of Surgeons	{	680A { right ....	....	21	25	84·0
		left ....	....	20	27	74·0
	{	680B { right ....	....	20	28	71·4
		left ....	....	19·5	29	67·2

A low index indicates a relative increase in the antero-posterior diameter with attendant flattening of the shaft. Tibiæ, with an index above 69, do not display any such tendency, and may be regarded as triangular in form.

The shafts of the bones, however, display a somewhat more extensive surface than usual for the attachment of the posterior tibial muscles. Manouvrier¹ has recently pointed out that the platycnemic form of tibia is dependent on an excessive development of the tibialis posticus muscle, and he points out that the increase in the antero-posterior diameter of the bone all takes place behind the interosseous ridge. He considers this excessive development of the muscle a sufficient cause, and in proof thereof avers that we meet with this form of tibia more frequently in races which inhabit mountainous countries, or in those who lead the lives of hunters. He contrasts the platycnemism of man and the anthropoids, and points out that they do not depend on the same cause; hence he does not regard the occurrence of platycnemism in man as a sign of degradation.

The chief point of interest in regard to the foot attaches to the presence of the facets on the astragalus and tibia, to which reference has been already made. The facets are apparently associated with an extreme amount of dorsi-flexion of the foot. Tennent² records a curious custom at one time prevalent among this people, namely, that of holding the bow with the foot. This

¹ "Memoir sur la Platycnemie." Mem. de la Soc. d'Anthr. Paris, 2^e Serie, tome iii. p. 469.

² Tennent, *loc. cit.* Vol. i, p. 499.

doubtless might account for such an arrangement of facets. Unfortunately, however, Hartshorne¹ referring to this matter says, "But at the present time, at any rate, this practice is entirely unknown, and it is difficult to understand how or why it should ever have existed." The same doubt seems to attach to their powers as climbers. Percival² evidently regards them as experts, for he details how "the Beddah climbs up the tree with the utmost expertness and celerity." Hartshorne³ on the other hand, writing in regard to their feet, says, "They have, in fact, no exceptional prehensile power in their feet, and they are bad climbers." However this may be, there seems to be little doubt that these facets are associated with some unusual posture, and in all probability they are due to the squatting position in which they sit. I have observed a similar arrangement of facets in two Australians, one male Andaman, and a new Caledonian, and it is worthy of note that such a condition is normal in the foot of the Bornean Orang.⁴

In regard to the greater length of the second toe as compared with the first, reference may be made to a paper by Mr. J. Park-Harrison, read at the meeting of the British Association at Southport in 1883. He found that the Tahitians, savage Islanders, Javanese, New Hebrideans, and New Caledonians possess this characteristic. Amongst Africans instances of its occurrence are rare.

Crania (Oxford Specimens).

No. 736.—This, the skull of an adult male which belonged to the Greenwell Collection, was obtained by Lieutenant A. F. Perkins, of the Ceylon Rifle Regiment, from a native Ceylonese chief. Cranial capacity, 1,430 cc. The skull is strong and heavy. In the upper jaw only the second premolar and first and second molars are present on either side. In the lower jaw, on the left side, the second premolar and first molar are *in situ*, on the right side, all the molars and second premolar are in position. All the alvéoli of the other teeth are open. The teeth present are large, ground flat on the crowns, and present no appearance of decay.

Norma lateralis.—The frontal tubera are very prominent, giving a very vertical appearance to the forehead, thence the curve sweeps gently back to the region of the obelion, at which point it suddenly turns vertically downwards towards the inion, whence it passes horizontally forward; in other words, the

¹ *Loc. cit.*, p. 408.

² "An Account of the Island of Ceylon." London, 1805, p. 285.

³ *Loc. cit.*, p. 408.

⁴ "Journal of Anatomy and Physiology," vol. xxiii, p. 616.

cranium may be described as flat in the frontal region, over the vertex, and on the upper and lower occipital squamæ, with the angles rounded off. There is a shallow post-coronal depression extending some distance across the vertex.

Norma verticalis.—Long and narrow; cephalic index 68.8. The parietal eminences are well-marked and placed far back; behind them the skull narrows rapidly towards the upper occipital squama. The skull is cryptozygous.

Norma occipitalis.—Well-marked pentagonal form.

Norma basalis.—Foramen magnum, nearly circular, 35 × 33 mm., directed slightly forwards; the condyles are placed very obliquely.

Norma frontalis.—Frontal region narrow, flat in the region of the glabella, and with but slight indications of superciliary ridges; orbits not large, are of rectangular form. Malars not projecting.

Sutures.—Complex, simple at obelion and bregma. The lower part of the coronal suture on the right side is synostosed; a triangular epipteric is present in the right pterion, evidently the separated superior angle of the alisphenoid.

Processes.—Mastoids well-developed; the external occipital protuberance pointed; styloids long and entire. External pterygoid plates narrow.

Muscular impressions.—Faintly marked. Lower jaw, small; slight mental projection.

No. 737.—Cranium of an adult female obtained by Lieutenant Perkins from a native chief, and presented by him to Canon Greenwell. Cranial capacity, 1,390 cc.; only the first and second molars on either side are *in situ*. All the alveoli are still open. Teeth present, large, healthy, and ground flat on the crowns.

Norma lateralis.—Frontal tubera fairly prominent. The slope is more gradual towards the vertex than in No. 736; so also from the obelion to the inion the curve is more rounded, thence it passes more abruptly forward.

Norma verticalis.—Remarkably long and narrow; cephalic index, 67.8. There is little increase in width over the parietal eminences, which are poorly developed. Cryptozygous.

Norma occipitalis.—Of pentagonal form, with well-marked angle at vertex; the greatest diameter exceeds the asterionic diameter by only 22 mm.

Norma frontalis.—Frontal region narrow, eminences fairly prominent, glabella flat, slight superciliary projection internally. Towards the vertex in the region of the sagittal suture there is a well-marked ridge. Orbits large and more rounded than in the last specimen. Nasals not so prominent, malars flattened and appressed.

Norma basalis.—Foramen magnum 36 × 28 mm., somewhat diamond-shaped; looks directly downward.

Sutures.—Much more simple than in No. 736; small wormian bones are present in the postero-lateral fontanelle.

Processes.—Mastoids small, external occipital protuberance slightly projecting, external pterygoid plates broad, sphenoidal spine prominent on the left side.

Muscular impressions.—Scant; surface as as rule smooth.

No. 738.—This skull was presented to Professor Rolleston by Mr. W. Sabonadiere, who obtained it from Mr. Henry Mooyaart, Government Agent of the Province of Ouvah. The latter gentleman forwarded to Mr. Sabonadiere a report in Singhalese from the headman of the district, of which the following is a translation:—"Ridimaliadda R.M. reports that according to orders given by your honour on your last visit, the skull of Kapura Gammahey, a genuine Veddah of the age of 80 or 90 at his death, and a resident of Belagama in Bintenna, has herewith been forwarded," dated January 13th, 1864. The cranium is evidently that of an aged person. Capacity, 1,350; the teeth are absent, and the alveoli completely absorbed.

Norma lateralis.—The form of the cranium resembles closely those already described. The curve of the vault is more general throughout, the frontal eminences less prominent. In the occipital region there is a tendency to flattening. The external occipital protuberance is V-shaped and strongly marked.

Norma verticalis.—The skull presents a remarkable appearance. The greatest length is 187 mm. The greatest breadth taken over the situation of the parietal eminences is only 120 mm. From this it will be gathered that these prominences are scarcely, if at all, developed. The cephalic index is extremely low, 64·5, the lowest in the series belonging to the Oxford collection, and lower considerably than those described by Virchow, Flower, or B. Davis. Cryptozygous.

Norma occipitalis.—Forms a well-marked arch with parallel sides, the mastoids projecting somewhat below.

Norma basalis.—Foramen magnum long and narrow, 37 × 23 mm., directed slightly forward. The condyles are curiously formed; they are very small. The articular facets, measuring 17 mm. long by 11 mm. wide; their inner borders are placed parallel to each other, and their anterior extremities are 22 mm. apart. They might be better described by stating that it appears as if only the posterior half of the condyle had been developed, the anterior half with its articular surface being absent.

Norma frontalis.—The frontal width is greater than in the foregoing specimens. The superciliary ridges are more pro-

nounced than is usual in these skulls, the frontal eminences less so. Glabella prominent. Orbits relatively large. Malars appressed. Nasal bones curved and projecting.

Sutures.—Synostosis has taken place throughout the entire length of the sagittal suture, in the lateral parts of the coronal, and in the upper part of the lambdoid.

Processes.—Mastoids strong, external occipital protuberance projecting, external pterygoid plates broad with pointed processes. Sphenoidal spine large; grooved foramen spinosum.

Muscular impressions.—Well-marked temporal ridges. The different surfaces for muscular attachment on the occipital bone are strongly indicated.

No. 739 is the cranium of a male of middle age presented to the museum by Mr. B. F. Hartshorne. Cranial capacity, 1,395 cc. All the teeth are lost except the second left molar, the crown of which begins to show evidence of wear. The alveoli of all the remaining teeth are perfect.

Norma lateralis.—The superciliary ridges are strongly marked, the frontal tubera but slightly; the curve from ophryon toinion is more general throughout, there being but a slight increase in prominence at the obelion. The external occipital protuberance lies within the maximum length, and is not strongly marked.

Norma verticalis.—The skull is long but the parietal tubera are outstanding; the temporal fossæ are deep, and the temporal ridges on either side pass within 42 mm. of the sagittal suture. Phaenozygous.

Norma occipitalis.—Pentagonal in form. The upper and lower occipital squamæ are compressed laterally so as to cause the maximum occipital point to form a marked projection, below which we have the external occipital protuberance.

Norma basalis.—Foramen magnum, oval, 36 × 28 mm., looks directly downward.

Norma frontalis.—Glabella prominent, superciliary ridges strongly marked, nasal bones curved and projecting, orbits of square form. Malar bones and zygomatic arches more projecting, as will be seen by a reference to the table; the interzygomatic and outer malar widths are greater than in other members of the series measured.

Sutures.—Much serrated. Frontal suture persistent. Epipteric bones are present on both sides. These are of large size and correspond either to the separated anterior inferior angle of the parietal or to the upper angle of the alisphenoid. On either side in the angle between the squamous and mastoid temporals there is a small wormian bone. In the right asterion there is a wormian bone.

Processes.—Mastoid of medium size. External pterygoid plates broad with pointed processes on the posterior border.

Muscular impressions.—The temporal ridges pass up on the parietals to a higher level than usual. The inferior squama of the occipital bone is rough.

No. 740.—Cranium obtained from Mr. B. F. Hartshorne, probably that of a male about middle life. In regard to Nos. 739, 740, and 743, Mr. Hartshorne writes (date April 29th, 1872):—"I am glad to say that I am sending you three Wedda skulls; but one is broken, and I could not get lower jaws. I also send some bones; all the bones in the box are Wedda bones. They come from the country of the Jungle Weddo, and I am certain of their authenticity, as I know the country, and got the skulls and bones from the headman of the district, who could have no means of getting any skulls of any one but Weddo. There is one man called Heen Appa, who lives on the borders of the Weddo country by himself; he has land, and is specially charged by Government to look after the Weddo. His chief duty is to bury their dead, in order that wild beasts may not prey upon them, and when a Wedda dies, the others come and tell him, and he goes and buries the body. The Jungle Weddo will not go near a dead body. I employed this Heen Appa to get the skulls; he is trustworthy."

The capacity of this cranium is 1,330 cc. There are no teeth; the alveoli corresponding to the premolars are absorbed.

Norma lateralis.—The appearance of this skull closely resembles that of No. 736, though it is hardly so flat on the vertex. The forehead is vertical, and the frontal tubera prominent; the lower occipital squama is more convex.

Norma verticalis.—The parietal eminences are outstanding, the width, 134 mm., relatively great to the length, so that the index, 76.1, is somewhat higher than most of the others. It is exceeded only by No. 743 in this collection, which, however, is injured. Cryptozygous.

Norma occipitalis.—Greatest width at parietal eminences.

Norma basalis.—Foramen magnum, 34 × 31 mm. It approaches in shape the diamond form, the posterior angle being rounded off, directed very slightly forward. There is a very large jugular fossa on the right side.

Norma frontalis.—Frontal eminences prominent, forehead smooth, no superciliary ridges; orbits more rounded. Nasal bones wanting; malars appressed.

Sutures.—Simple; a large epipteris is present on either side similar in form and size to those in No. 739. A small interparietal bone is present.

Processes.—Small mastoids; narrow external pterygoids, slight

sphenoidal spines. Little evidence of strong muscular development.

No. 741.—This cranium was presented by Mr. Hartshorne to the museum. A peculiar interest attaches to it, as there appears to be good evidence for stating that it is the skull of Latty, described and measured by Mr. Hartshorne in the *Fortnightly Review*, March, 1876. In support of this, the following evidence may be submitted. Copy of a letter of date January 17th, 1876:—"In obedience to your order of the 8th instant, I beg to submit the following with reference to the skull I sent you some time back. The skull was that of a Wedda called Latha. He lived at Kandapolapele of Sujambala-winnègama, in Bintenna, age 19 years—died in 1873. He was of Morane race—was sick of worm complaint for three days.—Signed, Ridemaliyadde, R.M."

In reference to the above, Mr. Hartshorne, in a letter dated March 2nd, 1876, writes to Professor Rolleston, as follows:—"The man who got it is an excellent native chief, who is the only man who can do anything with the Weddas. He is the Ridemaliyadde (Ratimahameya), and you have got a Sinhalese letter of his which you once showed me. . . . I think it is that of a man whom I knew very well and of whom I have got a photograph. . . . I described him in 1872 as aged about 18, and he died in 1873 aged 19. . . . You will find an account of him and all his measurements in the *Fortnightly Review* for this month, pp. 408 and 412. This all makes the skull very curious and interesting. The word Latha in the letter is the same as Latty (the final y being pronounced like the word 'eye.' It is the Sinhalese form of the Wedda word, as the termination 'eye' is quite unknown to Sinhalese nouns)." ¹

The capacity is 1,420 cc. The teeth present show little evidence of wear and no signs of decay. The incisors, the left canine, and the third left molar are wanting; their alveoli, however, are present.

Norma lateralis.—Presents the characteristic elongated form. Forehead vertical, superciliary ridges slight. Frontal tubera fairly prominent—flattened over the vertex and in the region of the lambda. External occipital protuberance not prominent in itself, but rendered apparent by the moulding of the occipital squamæ.

Norma verticalis.—Parietal tubera prominent; temporal ridges encroach on the vertical aspect. Cryptozygous.

Norma occipitalis.—Occipital pentagon well-marked. Parietal

¹ It is worthy of note that the head man mentioned above is the same as that from whom Mr. Sabonadiere obtained his specimen, No. 738, presented by him to Professor Rolleston.

eminences outstanding, the sides slightly converging below their level.

Norma basalis.—The inferior squama of the occipital bone is so moulded that it is concave between the two curved lines, especially near the external occipital protuberance, convex between the inferior curved line and the foramen magnum. Foramen magnum of oval form, slightly encroached upon by the condyles anteriorly, measures 35×30 mm.; its plane has a slight forward inclination.

Norma frontalis.—Forehead narrow, glabella well-marked, superciliary ridges comparatively slight. The orbital margins are thick, however; orbits comparatively large, nasal bones curved and projecting, malar bones not projecting.

Sutures.—Complex, simple at obelion and at lower parts of coronal. Numerous small wormian bones on the lateral parts of the lambdoid suture.

Processes.—Mastoids small; sphenoid spines long and curved forward. External pterygoid plates not broad, but deeply notched on the posterior border.

Muscular impressions.—The temporal fossæ, as defined by the upper temporal ridges, are extensive, and pass up on to the vertical aspect of the cranium. Other indications feeble.

No. 742.—The skull of an adult female. I can obtain no further information regarding this skull than that it was received on February 10th, 1874. The cranium is small, its capacity measures 1,205 cc. Only the first molars on either side remain *in situ*; none of the alveoli are absorbed. The teeth present are moderately worn.

Norma lateralis.—Precisely similar in form to the preceding No. 741. Forehead vertical, low; frontal tubera prominent; very slight orbital ridges. Occipital tubercle faintly marked.

Norma verticalis.—Parietal eminences prominent. Cryptozygous.

Norma occipitalis.—Pentagonal in form.

Norma basalis.—Injured.

Norma frontalis.—Glabella well-marked; slight superciliary prominence over the inner side of orbit; frontal tubera pronounced. Face small; malar bones small and appressed; orbits of square form.

Sutures.—Comparatively simple.

Processes.—Mastoids small; narrow pterygoids.

Muscular markings faint.

On the right side immediately below the parietal eminence there is a circular spot about the size of a shilling, where the bone is eroded superficially by disease; the bone round the margin of this area is somewhat thickened.

No. 743.—This calvaria, probably that of an aged female, is much injured; the greater part of the base is wanting. Mention has been already made of this skull in the description of No. 740. It appears to have been artificially compressed, producing a well-marked flattening on the left side posteriorly and on the right side anteriorly. The sagittal suture is almost obliterated. In the *norma verticalis* it appears relatively broad. The cephalic index, 77·5, being the highest of these belonging to the Oxford collection. The foramen magnum is of diamond shape, 35 × 28 mm.

No. 836E.—This is the skull of the skeleton already described. It is in a perfect state of preservation, all the teeth are *in situ* in both upper and lower jaws; they are small, in perfect condition, and but slightly worn. The cranial capacity measures 1,265 cc.

Norma lateralis.—Forehead vertical, frontal tubera well-marked, the curve of the vertex is not so flattened as in the other specimens. The highest point corresponds to the bregma. The occipital point falls considerably beyond the external occipital protuberance.

Norma verticalis.—Long and narrow, widest at parietal tubera, slightly flattened behind on the left side over the upper occipital squama and the portion of the parietal bone posterior to the tubera. Cryptozygous.

Norma occipitalis.—Well-marked pentagon, tendency to a ridge at the sagittal suture.

Norma basalis.—Foramen magnum oval, 33 × 25 mm., plane directed slightly forward.

Norma frontalis.—Forehead smooth narrow, frontal tubera prominent, only the slightest indication of superciliary ridges; nasal bones small but prominent; malars small and appressed; orbits more circular in form than in most of the specimens; nasal spine prominent.

Sutures.—Simple; fusion between basi occipital and basi sphenoid complete; in the left orbit the suture over the infra orbital canal is still visible.

There is a wormian bone in the left asterion.

Processes.—Mastoids small. Sphenoidal spines large. External pterygoid plates narrow and margin comparatively regular.

Muscular impressions faint. In regard to the teeth of this specimen, which are in a perfect state of preservation, it may be worthy of note that in the three upper molars there are four distinct cusps, in the lower molars the first only possesses five cusps, the second and third only four cusps each. There is little difference in size between the upper and lower molars; the second lower molar is, if anything, smaller than the second upper.

Lower jaw of small size and feeble development.

I have incorporated in this report the crania in the collection of the Royal College of Surgeons, and those in the possession of Dr. Barnard Davis. In regard to the former, I have to express my thanks to Professor Stewart, the Curator, for opportunities of examining a number of specimens which have been added to the museum since the publication of the last catalogue. In the table of measurements appended I have also included the crania described by Professor Virchow in his monograph.

Nine skulls in all belonging to the Oxford collection were examined, of that number probably six were male and three female. All were adult, and one, No. 738, was the cranium of a male stated to be eighty or ninety years of age. In the imperfect calvaria, No. 743, synostosis has taken place along the line of the sagittal suture. In all the other specimens, with one exception, where the teeth are absent, all the alveoli are still open. The exception referred to is No. 740, where the premolars have been shed during life.

The cranial capacity ranges from 1,430 cc. in a male (736) to 1,205 cc. in a female (741). The average of the six males = 1,365 cc. The male described by Virchow measured 1,360 cc. The mean capacity of the ten male skulls in the museum of the Royal College of Surgeons is 1,290 cc. The three males in the collection of B. Davis yield an average of 1,415 cc., but this includes a specimen with the exceptionally large capacity of 1,611 cc. In all twenty male crania have been measured, of which the average capacity is 1,336 cc. Two only of the females in the Oxford collection could be accurately measured, of which the mean is 1,297 cc. The two described by Virchow average 1,137 cc. Of three in the R. C. S. collection the mean is 1,108 cc.; but it is worthy of note that one of these, No. 679, is one of the smallest adult skulls on record. Five females measured by B. Davis yield an average of 1,258. The average of the twelve female crania noted above equals 1,207 cc., showing a difference of 129 cc. between the capacities of the males and females.

As, however, the male skull belonging to the collection of B. Davis is quite exceptional in regard to capacity, 1,611 cc., being 246 cc. in excess of the average, I have withdrawn it and find that the average of the nineteen remaining skulls is 1,321 cc. Similarly the exceptionally small female skull in the R. C. S. collection has not been included in the average of eleven females which equals 1,229 cc., a result which is probably more approximately correct. The difference between the male and female cranial capacities is therefore 92 cc. The skulls as a whole, therefore, are microcephalic, though of the twenty-seven crania measured, eight male skulls measure 1,350 cc. and

upwards, and are therefore mesocephalic; of this number one, viz., that belonging to B. Davis, is megacephalic. Two females in this series are mesocephalic. Contrasting the cranial capacity of this race with other races of small stature, we find that the average capacity of the male Andaman is 1,244 cc. The mean of five Bush skulls described by Turner¹ is 1,281 cc. The Akkas described and figured by Professor Flower² have a capacity, the male of 1,102 cc., the female of 1,072 cc. No male Veddah is the same as the former, but there are two females in the thirty-one crania examined which are smaller than the female Akka, viz., one described by Virchow, the capacity of which is 1,025 cc., and that already referred to in the College collection with an internal capacity of 960 cc.

Norma lateralis.—Of eight skulls belonging to the Oxford collection, one (No. 739) rested upon the tip of the mastoids, one (No. 737) on the occipital condyles, the remainder (six) upon the conceptacula cerebelli.

The glabella-occipital and ophryo-occipital lengths may be regarded as identical, the difference is so slight. The six males average 182.5 mm. in length, three females 170 mm.

The average basi-bregmatic height of six males in the Oxford collection is 132 mm., of two females the same—yielding an average vertical index of 72.6 in the males, and 74.9 in the females. The males may be regarded as tapeinocephalic, the females as metricephalic. The average vertical index of twenty-one males gives a somewhat higher figure, viz., 74.3, an index which places them in the metricephalic group. Fourteen females average 75.7. The crania then may be regarded as metricephalic. In all the skulls belonging to this collection there was a marked uniformity in the curves of the antero-posterior circumference. The frontal tubera are as a rule prominent, giving a vertical appearance to the forehead, the superciliary ridges being but slightly developed. The curve over the vertex is slight, with in some cases a tendency to flattening associated with a somewhat rapid slope downward from the obelion to the inion. The maximum occipital point in all cases projects beyond the occipital protuberance, but only to a slight degree. The cerebellar fossæ are comparatively shallow. No. 743 appears as if artificially flattened in the occipital region.

In all but two instances the frontal longitudinal arc exceeds the parietal longitudinal arc; in the two exceptions the arcs are equal, in every case the parietal arc is longer than the occipital.

¹ "Challenger Reports," vol. x, "Report on Human Crania, &c.," p. 17.

² "Description of two Skeletons of Akkas," Professor Flower. "Journal of the Anthropological Institute," vol. xviii, Aug., 1888, p. 6.

The nasal bones are short, but the bridge is well-formed and prominent, as a rule concavo convex from root to tip.

The gnathic index of the five males averaged 94·2. The mean gnathic index of twelve skulls is 94·7—they belong therefore to the orthognathous group.

Norma verticalis.—Long and narrow, the parietal eminences in most cases pronounced and placed well back. Behind the parietal tubera the cranium slopes abruptly to the upper occipital squama. The greatest width is with two exceptions situated at or near the parietal tubera. In six males the average breadth measures 128 mm., in three females 124 mm. The cephalic index of the six males averages 70·3, of three females 72·8. The average cephalic index of the twenty-one male crania, of which measurements have now been given, is 70·9, of fifteen female crania 73·2. The average index of the males is therefore lower than any of the averages given in the table at the end of the catalogue of the crania in the Museum of the College of Surgeons of England. Therein the average of 27 Eskimo is given as 72·2; 53 Australians, 71; 72 Melanesians, 71·4; 46 Africans, 73·6; 11 Kaffirs and Zulus, 73·1; 6 Bushmen, 76·8. In reference to the above it will be seen that the index of the female crania is higher than the male; taking both together, a total of 36 crania, the index average is 71·8. Turner¹ gives the mean of 37 adult Australians = 70. Of that number 20 were males, with an average index of 69. The females on the other hand yielded a higher index, 72. The Veddahs are therefore not so pronounced in the dolichocephaly as the Australians, though they closely approach them.

Sir William Turner, in discussing the causes of dolichocephaly,² refers to the relative growth of the bones. "Skulls which owe their dolichocephalic proportions to this dominating growth of the two parietal bones, may be said to exhibit parietal dolichocephaly." In the specimens in the Oxford collection the frontal longitudinal arc exceeds in all but two instances the parietal arc, and in the two instances referred to these measurements are equal. We cannot therefore explain the dolichocephaly by an unusual growth of the parietal bones in the present instance.

Of the skulls in the Oxford series two were mesaticephalic. In one instance, No. 738, the index, 64·5, was exceptionally low, and it is worthy of note that in this, the cranium of a person of between 80 and 90 years of age, the sagittal suture, though synostosed, was not completely obliterated, so that we can hardly explain the low index as due to a premature ossification of the suture.

¹ "Challenger Reports," vol. x, "Human Crania," p. 127.

² "Challenger Reports," vol. x, "Human Crania," p. 127.

All the skulls, with one exception (No. 739) are cryptozygous.

In several of the skulls there is a tendency for the temporal ridges to encroach on the vertical aspect.

Norma occipitalis.—Of well-marked pentagonal form, as a rule. In most cases the parietals form a well-marked angle along their line of union at the sagittal suture, and in four specimens this was so marked as to present almost the appearance of a ridge; with two exceptions the greatest width is at or near the parietal tubera. As seen from the back, the cerebellar fossæ are flat and shallow.

Norma basalis.—The cerebellar fossæ in all are narrow and compressed laterally on the inferior occipital squamæ. The foramina magna are, as a rule, elongated, of oval form or diamond shaped. The basi sphenoid is narrow and proportionately long.

Norma frontalis.—Frontal region narrow and not high, but more or less vertical on account of the projection of the frontal tubera. As a rule the superciliary arches are but slightly prominent. The face is short and narrow, the ophryo-alveolar length in no case exceeding 82 mm. The average bi-zygomatic width of six males is 122.5. The bi-zygomatic width in all cases is greater than the stephanic diameter with one exception, the bi-malar and stephanic diameters do not differ by more than 8 mm. The measurements of the naso-alveolar and ophryo-alveolar lengths on No. 738 can not be regarded as trustworthy, as the alveoli of the upper jaw are completely absorbed.

There is no alveolar prognathism. The mean gnathic index of five male specimens is 94.2. Twelve crania yield a mean of 94.2; five females, two in the Oxford collection and three in the College, average 93.6. The crania are therefore markedly orthognathous.

There is some difference in the individual skulls in regard to the projection of the nasal processes of the superior maxilla, a factor on which is dependent the prominence of the lateral nasal margin. The nasal bones are small, in no case do they exceed 22 mm. in length; they are well-formed and usually projecting, their crest being concavo-convex from above downward.

The nasal index of fourteen males, including six Oxford and eight College crania, is mesoshine 52.7. Out of these fourteen there are seven which are over 53, and which are therefore platyrrhine, so that at present we have not sufficient data to form a decided opinion. Moreover, in the five females of which we have measurements, and of which the average is 51, two of those in the College of Surgeons are platyrrhine.

In all but one the lower nasal margin is sharp and the nasal

spine prominent, a well-marked ridge indicating the position of the intermaxillary suture immediately below the nasal spine.

The orbits are mostly of quadrilateral form. The average index of the fourteen male specimens as above is 85.1, of five females, 86.8; they are therefore mesoseme. The orbital margins are sharp and thin as a rule, and there is little difference between the male and female specimens. The os planum of the ethmoid is somewhat narrow in front; in two cases it measures 5 and 6 mm. respectively, in its vertical diameter. An infraorbital suture is present in four out of the eight specimens available for examination.

Adopting the nomenclature proposed by Turner¹ in regard to the palato-maxillary index, we find that out of six males two are dolichuranic, two are mesuranic, and two are brachyuranic; the mean index of the six (113) is mesuranic. Of two females one is dolichuranic.

In form the palate is elliptical in five instances, and slightly hyperbolic in three.

There are two lower jaws in the Oxford series. They belong respectively to specimens numbered 736 and 836. Small in size, they are feeble in form, with but slight mental projection; the incisor teeth are set vertically in their alveoli.

Teeth.—In only two specimens could the measurements be taken according to Flower's² formulæ. The dental length of No. 741 is 36 mm., its basi-nasal length, 97 mm., yielding an index of 37.1. Similarly in No. 836 the dental length is 37, the basi-nasal 93, the index 39.7. Flower classifies all with an index below 42 as microdont, a group into which the above naturally fall.

From an examination of the alveoli of the upper jaw the fangs of the wisdom teeth appear in most instances to have been fused and conate; in two specimens, however, the alveoli for three separate fangs are distinctly shown.

Sutures.—One skull is metopic. In only two instances is there sagittal synostosis, so that early fusion of this suture can hardly be urged as an explanation of the extreme dolichocephaly. In two of the crania, epipterics are formed in the region of the pterion; on the other hand, the spheno-parietal suture is comparatively wide, averaging 14 mm. in the series. Wormian bones occur as already described.

Processes.—The mastoids as a rule were small and poorly-developed; in only one instance did the skull rest upon the mastoids. In one or two instances the spine of the sphenoid was

¹ "Challenger Reports," vol. x.

² "On the Size of Teeth as a Character of Race" ("Journal of the Anthropological Institute," vol. xiv, 1884, p. 183).

long, and doubtless was connected to the expanded external pterygoid plate by a well-marked pterygo spinous ligament.

Muscular impressions.—There was but faint indication in the series examined of strong muscular development. The skulls as a whole were comparatively smooth, the only point worthy of note was the fact that in some instances the temporal ridges encroached upon the vertical aspect.

The affinities of the Veddahs have been often discussed. The language is admitted to be allied to Tamil, with a certain percentage of words of Sanskrit origin. Professor Max Müller, in discussing the subject of the Veddah language,¹ says, "But I may say so much, that more than half the words used by the Veddahs are, like Singhalese itself, mere corruptions of Sanskrit. Their very name is the Sanskrit word for hunter (veddha), or, as Mr. Childers supposes, vyadha. There is a remnant of words in their language of which I can make nothing as yet; but so much is certain, either the Veddahs started with the common inheritance of Aryan words and ideas, or at all events they lived for a long time in contact with Aryan people, and adopted from them such words as were wanting in their language." Others maintain that in construction as well, the language resembles Sanskrit. This view is supported by Dr. Tylor.² Virchow,³ on the other hand, disputes it on the ground of insufficient proof. In this connection it may be interesting to note that the Wuddiars, one of the wandering tribes of Southern India, whose language is undoubtedly Dravidian, frequently "act plays derived from the Sanskrit with very considerable skill and power."⁴ How far then this mixture of Sanskrit with the Tamil indicates an Aryan descent or mixture it is difficult to say.

The object of the present paper is rather to discuss the physical affinities of this singular race. If they be a mixed race they have to a certain extent developed into a distinct variety, for so far, as most observers relate, they do not intermarry with the Tamils or Singhalese.

The skulls, of which a very considerable number have now been measured and described, all show a remarkable uniformity.

The most remarkable feature in connection with them is their low cephalic index, their small capacities, and the fact that with one exception they are cryptozygous.

¹ "Address at the International Congress of Orientalists." "Selected Essays," London, 1881, vol. ii, p. 27.

² "Journal of Ethnological Society." New Series, vol. ii, p. 96.

³ "Ueber die Weddas von Ceylon. Acad. Berilonensis." "Classic Physica," 1881-82, p. 101.

⁴ "People of India," Watson and Kay, vol. vii, No. 405.

VEDDAH CRANIA.

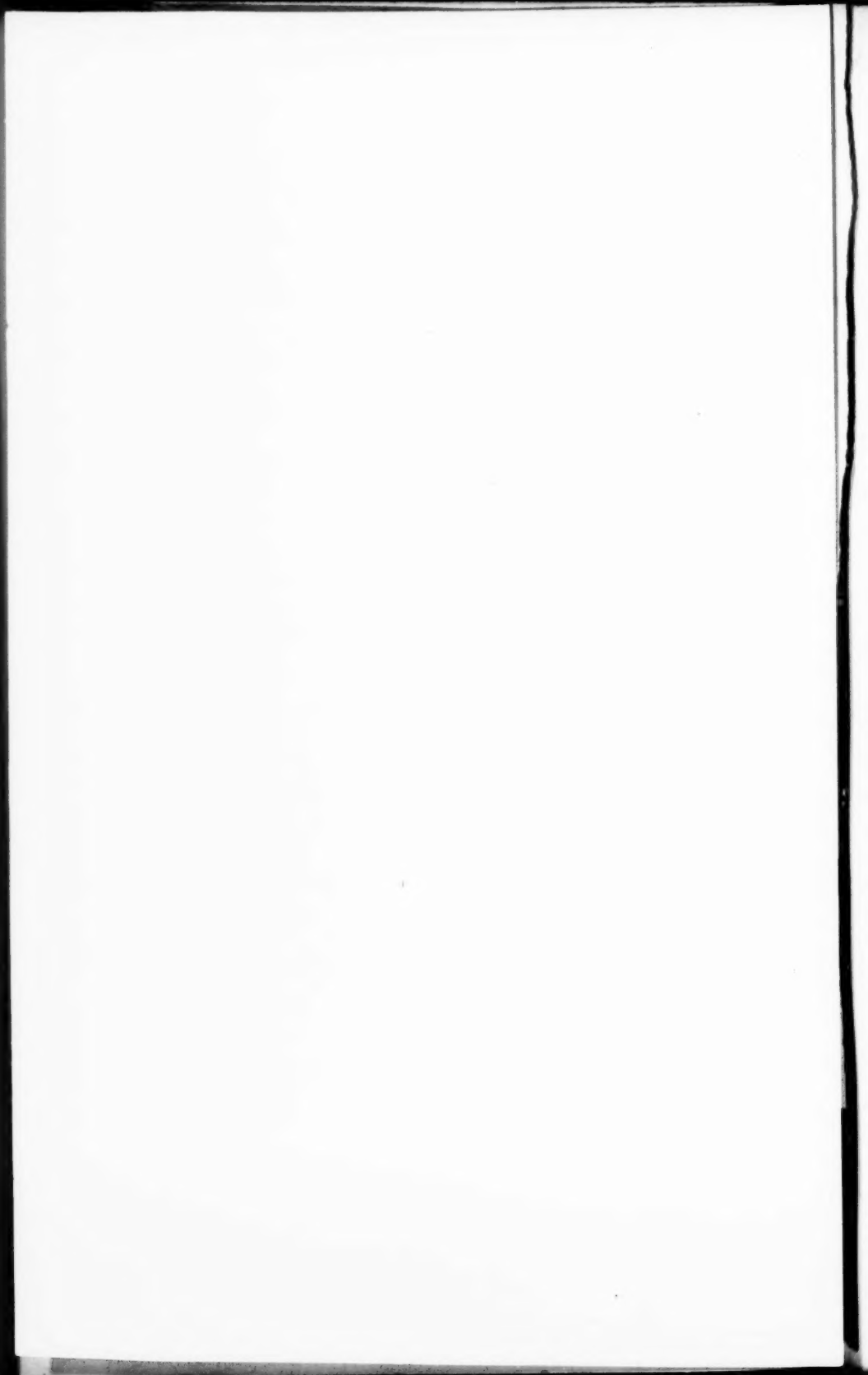
PROF. VIRCHOW.			ROYAL COLLEGE OF SURGEONS OF ENGLAND.																	
1	4	5	675	676	677	678	679	680	681	682	680A	680B	680C	680D	680E	680F	681A	3-313	3-400	4-471
♂	♀	♂	♂	♀	—	♂	♀	♂	♂	♂	♂	♂	♂	♂	♀	♂	♂	♂	Aged	
1,250	1,025	1,360	1,140	1,225	1,235	1,250	960	1,225	1,260	1,420	1,270	1,425	1,370	1,220	1,140	1,320	—	1,273	—	—
177	165	185	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	174	185	169
—	—	—	165	158	173	176	166	173	176	189	174	184	179	173	173	167	191	—	—	—
—	—	—	129	127	132	129	118	136	133	132	133	131	141	129	135	132	143	132	139	129
72.9	73.3	74.1	78.1	80.4	76.3	73.3	71.1	78.6	75.6	69.8	76.4	71.2	78.8	74.6	78.0	79.0	74.9	75.0	75.0	75.0
95	91	93	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
125.5 ps.	133	135	125	131	127	122	116	122	127	126	122	124	126	121	121	137	134	127 p	127 p	122 t
70.9	80.6	73.0	75.8	82.9	73.4	69.3	69.9	70.5	72.2	66.7	70.1	67.4	70.4	69.9	69.9	82.0	70.2	72.0	68.0	71.0
485	465	508	468	460	478	482	448	478	485	512	478	500	499	478	473	485	525	500	503	477
120	115	134	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	361	376	356
115	108	140	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
110	109	114	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
345	332	388	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
92	91	90	93	86	99	92	85	98	102	—	99	92	101	96	100	94	104	—	—	—
86	—	—	87	80	—	93	82	95	99	—	93	88	93	93	93	—	—	—	—	—
—	—	—	93.5	93.0	—	—	96.5	96.9	97.1	—	93.9	95.7	92.1	96.9	93.0	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	129	—	—
48	—	—	43	41	45	46	39	50	48	—	43	43	45	46	48	—	47	—	—	—
24	—	—	20	23	21	25	22	27	24	—	22	22	24	25	23	—	28	—	—	—
50.0	—	—	46.5	56.1	46.7	54.3	57.8	54.0	50.0	—	51.2	51.2	53.3	54.3	47.9	—	59.6	—	—	—
39	—	—	38	37	38	36	35	38	36	—	37	35	38	38	37	—	39	—	—	—
33	—	—	33	33	30	33	31	31	29	—	33	34	34	34	33	—	36	—	—	—
84.6	—	—	86.8	89.2	78.9	91.7	88.6	81.6	80.6	—	89.2	97.1	89.5	89.5	89.2	—	92.3	—	—	—

V E D D A H C R A N I A .

FORD COLLECTION.						PROF. VIRCHOW.			ROYAL COLLEGE OF SURGEONS OF LONDON.									
739 Ad. ♂	740 Ad. ♂ ♀	741 Ad. 19 ♂	742 Ad. ♀	743 Aged. ♀ ♀	836E 26 ♂	1 ♀	4 ♀	5 ♂	675 ♂	676 ♀	677 —	678 ♂	679 ♀	680 ♂	681 ♂	682 ♂	680A ♂	
395	1330	1420	1205	—	1265	1250	1025	1360	1140	1225	1235	1250	960	1225	1260	1420	1270	
184	176	182	172	160	179	177	165	185	—	—	—	—	—	—	—	—	—	
182	177	183	171	156	179	—	—	—	165	158	173	176	166	173	176	189	174	
130	136	132	128	—	130	—	—	—	129	127	132	129	118	136	133	132	133	
705	773	725	744	—	726	729	733	741	781	804	763	733	711	786	756	698	764	
96	89	84	88	—	87	95	91	93	—	—	—	—	—	—	—	—	—	
96	108	94	104	—	101	—	—	—	—	—	—	—	—	—	—	—	—	
94	104	102	96	100	102	—	—	—	—	—	—	—	—	—	—	—	—	
128 p	134 p	132 p	126 p	124 s	126	125.5 ps.	133	135	125	131	127	122	116	122	127	126	122	
696	761	725	733	775	704	709	806	730	758	829	734	693	699	705	722	667	701	
507	500	504	479	—	488	485	465	508	468	460	478	482	448	478	485	512	478	
127	141	133	130	117	130	120	115	134	—	—	—	—	—	—	—	—	—	
125 {	132 {	133 {	123 {	110 {	126 {	115 {	108 {	140 {	—	—	—	—	—	—	—	—	—	
120 {	108 {	112 {	106 {	105 {	114 {	110 {	109 {	114 {	—	—	—	—	—	—	—	—	—	
372 {	381 {	378 {	359 {	332 {	370 {	345 {	332 {	388 {	—	—	—	—	—	—	—	—	—	
293 {	305 {	295 {	278 {	284 {	288 {	—	—	—	—	—	—	—	—	—	—	—	—	
36 {	34 {	35 {	35 {	35 {	33 {	—	—	—	—	—	—	—	—	—	—	—	—	
99 {	94 {	97 {	96 {	—	93 {	92 {	91 {	90 {	93 {	86 {	99 {	92 {	85 {	98 {	102 {	—	99 {	
94 {	89 {	86 {	88 {	—	89 {	86 {	—	—	87 {	80 {	—	93 {	82 {	95 {	99 {	—	93 {	
949	947	887	917	—	957	—	—	—	935	930	—	—	965	969	971	—	939	
130	122	120	110	—	113	—	—	—	—	—	—	—	—	—	—	—	—	
112	100	103	98	—	96	—	—	—	—	—	—	—	—	—	—	—	—	
72	73	74	74	—	72	—	—	—	—	—	—	—	—	—	—	—	—	
55	57	56	54	—	54	—	—	—	—	—	—	—	—	—	—	—	—	
53	599	616	672	—	637	—	—	—	—	—	—	—	—	—	—	—	—	
45	43	43	44	—	42	48	—	—	43	41	45	46	39	50	48	—	43	
25	25	21	23	—	22	24	—	—	20	23	21	25	22	27	24	—	22	
555	581	488	523	—	524	500	—	—	465	561	467	543	578	540	500	—	512	
37	35	38	35	—	36	39	—	—	38	37	38	36	35	38	36	—	37	
32	31	31	29	—	31	33	—	—	33	33	30	33	31	31	29	—	33	
865	886	816	829	—	861	846	—	—	868	892	789	917	886	816	806	—	892	
51	48	46	48	—	50	—	—	—	—	—	—	—	—	—	—	—	—	
60	61	51	55	—	55	—	—	—	—	—	—	—	—	—	—	—	—	
1176	1270	1108	1145	—	1100	—	—	—	—	—	—	—	—	—	—	—	—	
—	—	—	—	—	28	—	—	—	—	—	—	—	—	—	—	—	—	
—	—	—	—	—	54	—	—	—	—	—	—	—	—	—	—	—	—	
—	—	—	—	—	42	—	—	—	—	—	—	—	—	—	—	—	—	
—	—	—	—	—	76	—	—	—	—	—	—	—	—	—	—	—	—	
—	—	—	—	—	79	—	—	—	—	—	—	—	—	—	—	—	—	
—	—	—	—	—	29	—	—	—	—	—	—	—	—	—	—	—	—	

80A	680B	680C
-----	------	------

[illegible]



In the entire series the height exceeds slightly the greatest width, except in one instance. They are markedly orthognathous, mesoseme, and mesuranic. The nasal aperture has a mean index which is mesorhine, but there is a marked tendency in several instances to platyrhiny.

Subjoined are the averages of the males and females respectively.

MALE VEDDAHS.

Cranial capacity, average of	19 = 1,321	cc. Microcephalic.
Vertical index, "	21 = 74.3	" Metriocephalic.
Cephalic "	21 = 70.9	" Dolichocephalic.
Gnathic "	12 = 94.7	" Orthognathous.
Nasal "	14 = 52.7	" Mesorhine.
Orbital "	14 = 86.8	" Mesoseme.
Palatal "	6 = 113.0	" Mesuranic.

FEMALE VEDDAHS.

Cranial capacity, average of	11 = 1,229	cc. Microcephalic.
Vertical index, "	14 = 75.7	" Metriocephalic.
Cephalic "	15 = 73.2	" Dolichocephalic.
Gnathic "	5 = 93.6	" Orthognathous.
Nasal "	6 = 51.0	" Mesorhine.
Orbital "	6 = 86.8	" Mesoseme.
Palatal "	2 = 109.0	" Dolichuranic.

The so-called aborigines of Southern India and the hill tribes so the Neilgherries, a people whose claim to be considered aborigines is disputed by Crawford,¹ in many respects resemble the Veddahs. Dr. Mouat² thus describes the skulls of the Southern tribes of India:—"Small in all dimensions, elegant, long oval dolichocephalic, tolerably orthognathous and European looking, their most striking character being their decided smallness and diminutiveness."

Callamand³, in his description of the skulls of twenty-one Maravars, refers to their peculiarities in the following words:—"Sutures simple; the greatest width is usually at the parietal bosses. Norma occipitalis pentagonal. The temporal ridges encroach on vertex; in one case 78 mm. is the distance that separates the two. Spheno-parietal suture 10-20 mm. in length. Superciliary arches slight, and glabella poorly developed. Orbits generally small. The line between nasal aperture and alveolar margin is well defined, not *en gouttière*. Marked absence of wisdom teeth. Mastoids small, occipital condyles small."

¹ "Transactions Ethnological Society," vol. vi, p. 59.

² "Skulls of Hill Tribes of India." "Transactions Ethnological Society," vol. vi, p. 43.

³ "Revue d'Anthropologie," vol. vii, p. 607. "Le Crâne des Noirs dans l'Inde." Callamand.

The above description might apply with equal truth to the Veddah skulls examined, with the exception of the reference to alveolar prognathism and the apparent absence of wisdom teeth. The skulls examined by Callamand were, however, phœnozygous; but in explanation of this he states that this was not due to eurygnathism, but to an unusual depth of the fossæ in the region of the pterion.

A comparison of the different measurements and indices brings out many points of correspondence.

	Maravars. 21	Veddahs.		
		Males.	Females.	Total.
Cranial capacity	1,281	20 = 1336	12 = 1207	32 = 1288
Vertical Index	75·2	21 = 74·3	14 = 75·7	35 = 74·8
Cephalic „	74·5	21 = 70·9	15 = 73·2	36 = 71·8
Gnathic „	—	12 = 94·7	5 = 93·6	17 = 94·4
Nasal „	52·0	14 = 52·7	6 = 51·0	20 = 52·2
Orbital „	83·0	14 = 86·8	6 = 86·8	20 = 86·8

From these data there appears little doubt that if the Veddahs be not of the same stock as the so-called aborigines of Southern India, they at least present very strong points of resemblance both as regards stature, proportions of limbs, cranial capacity, and form of skull. Numerous observers have drawn attention to similarities of hair and colour between these races, so that, on the whole, if physical features alone be taken into account, their affinities with the hill tribes of the Nilgherries and the natives of the Coromandel Coast, and the country near Cape Comorin, are fairly well proven.

DISCUSSION.

The CHAIRMAN having made some observations on the paper,

Mr. BOUVIERE-PUSEY remarked, in connection with the conjecture that the Veddahs may be classed with some aboriginal Negrito race, that he remembered a statement either in Turnour's "Mahawanro," or else in a legend given in the notes, that the first Aryan Prince in Ceylon married a Jakkho woman (lit., "demon woman," meaning probably an aboriginal), and that there were two children of this marriage, from whom the Veddahs descended.

Dr. SUMMERHAYES said that he had listened with great pleasure to Mr. Thomson's description of this primitive people. The anatomical details were most interesting to the anthropological student, and all pointed, in his opinion, to the fact that we have here

a specimen of aboriginal humanity, uncorrupted and unadulterated, but at the same time of a very early and therefore a low type of development. He was unable to see any marks or traces of fusion with any other of the more modern and more evolved divisions of mankind, and certainly not with either the so-called Aryan or the Turanian race. Still less did he believe there was any immixture of Negrito or Papuan blood in these curious people. He objected altogether to the introduction of linguistic considerations into arguments bearing upon the ethnological position of any of these primitive types of humanity; nor was it justifiable in these days to talk of Caucasians, which he regarded as an absolutely exploded term in science. Max Müller's notions about Aryan and Turanians were also quite antiquated. We have, however, in the Veddahs probably one of those "*ground races*" which Dr. Bertin has described in "North West Asia," and similar in many respects, and especially in *primitiveness* of type, as distinguished from *degradation*, to the *Mincopies* of Andaman, to the *Karens* and *Kachyens* of Burmah and Malaysia, to some of the hill tribes of Southern India, and to the *Dayaks* of Borneo, all of which belong to older and more primitive strata of humanity than any of the existing white, yellow, or negro populations.

Mr. G. BERTIN said that he had not the advantage of having examined personally the Veddahs, but if the accounts of travellers are to be trusted, they appear to have very primitive habits and customs; this, however, may be due to their isolation. From the evidence brought forward by Mr. Thomson, the Veddahs do not appear to belong to this primitive race, which is found everywhere as the first stratum of humanity, and called provisionally by the speaker the *ground race*. The Veddahs are Aryan by language and may be Caucasian by race; their present low state of civilization may be due to some adverse circumstance unknown to us, which led them to fall back into barbarism, in which they remained through their isolation. The ground-race type is marked by a small round head and a decided prognathism, which is not the Veddahs' characteristics. This race may be the result of crossing, as suggested by the Chairman.

Mr. THOMSON, in reply, stated that in drawing attention to the marked resemblances in the characters of the Veddah skulls to those of the Maravars described by Callamand, and of the Southern Hill Tribes mentioned by Dr. Mouat, he was not prepared to discuss the larger question as to whether these so-called aborigines of India were Dravidians or Caucasians.

The following Paper was read by the Secretary, and illustrated by the exhibition of the bull-roarers which produce the "Voice of Oro":—

NOTES *on the* YORUBA COUNTRY.

By MRS. R. BRAITHWAITE BATTY.

(Abstract.)

AFTER a detailed description of the Ondo tribe, and of Odo Ondo, their capital, attention is directed to the worship of Oro.

In the Yoruba country, Oro, the God of Vengeance, has its headquarters. Oro is a deity peculiar to the Egba tribe of the Yoruba race, but also adopted by other tribes. The name signifies "torment."

Oro is a god of terror and of vengeance. Some say that he is their deceased father come from the unseen world to confer a blessing on them yearly, and to remove inconvenient individuals from the land. It is the general belief of the female population of the whole Yoruba country that he is a deity who occasionally makes his appearance in the form of a human being wearing a pair of trousers extending down to the feet, and covering them, like the god Egun, with this exception, that the Oro wears a wooden mask, but the Egun veils his face.

Oro has his sacred groves, full of the relics of men who have fallen victims to his vengeance for their offences. Were a female, in the presence of a man, to place herself within the entrance of one of these Oro groves, it would be equivalent to a deliberate act of suicide on her part. So also, were a man to turn out a female member of his household during the dark hours of the night, a thing not unknown, or to persuade a woman—in ignorance of the nature of the place—to enter one of these groves, it would be almost equal to an act of murder. Oro generally puts in an appearance somewhere or another almost every night, and it is so uncertain when and where he may show himself that it is wise for every female who values her life, to keep at home between the hours of 7 p.m. and 5 a.m., as any woman getting a sight of, or finding out the secret of, Oro, must certainly be given over to him. If a man were to reveal the secret to any woman, and it became known to the authorities, both the man and woman would be given up and put to death without mercy; no bribe could alter the sentence. Oro administers his judgment in a manner not to be questioned by anyone. In the case of twin children born in a family, or locality where twins are forbidden, one of them is removed by

the Oro—in reality, destroyed by suffocation, and the corpse is taken to the sacred grove.

If a person, or persons, be said to be given to, or taken by, Oro, it is sufficient to stop further inquiries respecting them. The only certain thing is that they will never be seen again in this life. It is understood that the day a woman sees, or professes to know, what Oro is, her existence on earth ceases, and she is to accompany the god to the invisible world. It is the general belief that Oro swallows his victims alive, but in reality offenders are dragged alive by the feet, hands and feet being bound, till death puts an end to the torture. For minor offences the criminal is sold into hopeless slavery, never more to be allowed to return. The Oro sacred grove is not accessible to any but the devotees of the god. A woman might know all about the secrets in connection with it, and yet be safe, so long as she pretends ignorance, and does not divulge the secrets.

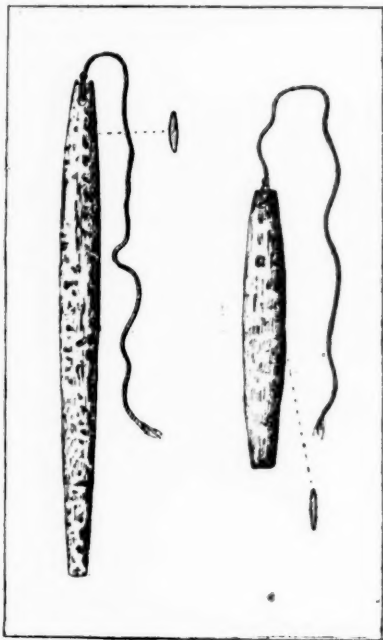
The Oro may make his appearance after giving due notice, so that the female population may keep themselves within doors, or he may appear suddenly in case of emergency—his voice being the signal for the confinement of the women. Those who may happen to be out of doors, the moment the voice of Oro is heard, veil their faces, and are escorted by the men to their homes. Women coming from a journey, or strangers, have to remain behind the walls of the town as long as the Oro is out.

There can be no doubt when Oro is near at hand, for his "voice" is often most unearthly, and being generally heard in the dark hours of the night, it appears all the more so. But in addition to the nightly visits of the deity, there are what are called "Oro days," extending from one to three or more in succession. For instance, when a general meeting at the King's Palace is to be called—or elsewhere—the bellman, or towncrier, goes round giving notice that on such and such a day "Oro will be out," and that a general meeting of men will be held at such and such a place.

Sometimes, when extending over several days in succession, a dispensation is given for about an hour or so in the evening, to allow of women taking food into the market or streets for sale, intimation of which is given by the firing of guns. All the Yoruba tribes do not hold this custom of Oro so strictly as the Egbas of Abbeokuta, and in their territory it is not strictly enforced, except in the towns. In Ibadan it has been done away with, and the Oro stick is played with only as a remembrance of past days, which is the case also within the vicinity of Lagos. Still even under these circumstances the men do not like to part with the Oro stick, or to allow it to come into the possession of a stranger, as it is the policy of the people to conceal to the

utmost of their power the instrument producing the voice of Oro, in order to make the uninitiated believe that it is actually the voice of some supernatural being.

The supposed "voice of Oro" proceeds from a small piece of wood, actually worshipped as a god—narrow and tapering at each end—somewhat thinner at the edges than in the middle, about one inch wide, and measuring from nearly a foot to three feet in length.



YORUBA INSTRUMENTS FOR PRODUCING THE "VOICE OF ORO."

(Scale one-sixth linear.)

This Oro stick is attached to a string, which is fastened to the thin end of a bamboo or pliable rod, of from six to eight feet or more in length, the string being about double the length of the stem or handle, which is used something after the fashion of a long carter's whip. The motion is horizontal, rotary, and continuous. According to the velocity and the size of the stick is the sound produced—sometimes a shrill high tone, sometimes deep and grave. The largest stick requires a man of gigantic strength to twirl it. Taking the handle in both hands, he twirls and twists the lash horizontally about his head, beginning

slowly, and gradually increasing the rate of speed till the Oro stick goes round as fast as he can make it, the sound made becoming shriller as the rate of the circular motion increases.

On the day of the appearance of Oro, the servants of Oro are posted at various distances from the sacred grove along the streets through which the god is to pass, and at various places in the town. Their business is to cause the "voice of Oro" to be heard by twirling the Oro stick at intervals as long as their strength will permit; their business being also to see that every female is confined within doors.

DISCUSSION.

Dr. E. B. TYLOR sent for exhibition several bull-roarers, accompanied by the following note:—

By the addition of Mrs. Batty's paper and specimens, the series of bull-roarers used in the ceremony and sport of various peoples now approaches all the completeness it is likely to reach. I send for exhibition with Mrs. Batty's Yoruba "Voice of Oro," two Australian, one Zuni, and one Scotch. It may be possible to add to the series at some time a Maori bull-roarer, of which the British Museum has a fine specimen, and the South African variety described by Theal, and mentioned in the "Journal of the Anthropological Institute." The only one which may have irretrievably perished is the Greek rhombos sounded in the Mysteries. The series brings remarkably into view the point that in ancient Greece, modern Australia, North America, and Africa, the instrument is one of sacred purpose. Only in Europe and the United States has it degenerated into a boy's plaything.

His Excellency GOVERNOR MOLONEY, C.M.G., has since sent the following note on Oro and the Oro-stick:—

In Yoruba (the Egbas resort pre-eminently to this practice), applied generally to the area over which the Yoruba language, or some dialect thereof is spoken, the *Oro* represents the active embodiment of the civil power, the local police, the mysterious head or idol of the Civil Government; it is interpreted as the executive of the State where it is practised, deified. The instrument by which it is proclaimed is the *Oro* stick, composed of a pliable stick resembling the handle of a whip, from the thin end of which is suspended by means of a string, four or five feet long, made from some native fibre, a thin flat tongue-shaped piece of wood about five inches long and two broad.

By means of the handle this tongue is given a rapid circular motion in the air, and then causes a weird noise not unlike that of wind playing down our chimneys at home during a storm; when such noise is made, *Oro* is said to be out and active.

The greatest reverence is extended by the natives to this instru-

ment, from fear doubtless of consequences. I have seen even so-called Christians awe-struck in its silent presence.

The law of the Egbas as regards *Oro* in connection with the close confinement of women in their houses is unalterable. Any woman, no matter her position or influence, who might be taken in the streets when *Oro* is out, would forfeit her life.

The supreme authority of a state or town seems to be invested in this mysterious and undefined power. When any public business is to be considered, a meeting is convened in the name of *Oro*. Sentences on criminals are pronounced under the same sanction. *Oro*, when out, is often supposed to perambulate a town for hours or even days together.

There are among the musical instruments of Yoruba the *Ogbonis'* (native freemasons) and *Oro* (native police) drums, called respectively *Agba-ogboni* and *Ilu-oro*; these drums, played in sets of four, resemble each other; the largest *Oro* drum is called *Obetè*, the others *Asipele*. They are used with the *Oro* stick to proclaim meetings of the *Oro* Society (composed chiefly of *Ogbonis* or *Oshogbos* freemasons) convened for the trial of public offenders, for the consideration of state questions, &c.

The following Paper was read by the Secretary:—

ON SALUTATIONS.

By H. LING ROTH.

CONTENTS.

INTRODUCTION.—Tylor's Gesture Language. The Encyclopædia Britannica. Classification.

- I.—Handshaking the symbol of friendship. Allied customs. Joining noses. Rubbing hand on nose and mouth. Savage wonder at wetting faces with lips. Fulness of noses due to nose salutation. Beechey's description. Hands drawn over faces. Smelling. Pleasure in rubbing noses. Nose rubbed on hand. Squeezing nostrils and grunting. Smelling hands. Inhaling. Chucking under chin. Handshaking. Presents demanded. Thumb pressing. Finger exercises. Snapping noise. Cracking fingers. Bowing and placing hands on breast and head. Stereotyped phrases. Cracking fingers. Apparent repulsion. Women do not greet. Cracking middle finger joints. Bunch of grass in hand. Trojan handshaking. Offer of left hand an affront. Embracing. Spouses do not embrace. Australian embracing. No kissing in Japan. Kissing in both America and Africa. Restricted area of kissing. Kissing derived from mutual licking of animals an absurdity. Esquimaux licking hands. Ceremonious Biluchi salutations. Ceremonious Aino salutations.
- II.—Crouching a gesture of fear. Hainan greeting. African genuflections. Patting stomachs and clapping hands. Slapping breasts. Clapping hands. Lively African morning's greetings. Clapping hands. Bowing. Embrac-

ing. Genuflections. Clapping hands. Extension of arms. Stroking body. Wajiji boatmen's salutations. Raised closed hands. Malay custom similar. Hands raised to lips and forehead. Easter Island greeting. Besmearing with mud. Drumming ribs with elbows. Touching ground with cheeks. Clapping hands. Chiefs make feint to rub with sand. Mud rubbed on left side first then on right. Stereotyped words of greeting. Clapping hands and rubbing mud on breasts. Kneeling before superior. Handshaking and embracing. Modern Greek salutation. Greeting a priest. Turkish greeting. Todas "masonic sign." Seizing the foot. Distinctions between salutations of men and women. Siamese squatting. Japanese politeness. Affirmation by nodding the head. New Zealand assent. Yorkshire form of acquiescence.

III.—Uncovering the upper and lower part of the body. Low bows. Doffing headgear. Uncovering the feet. Chancellor Cromwell foretold his fall.

IV.—Expression of goodwill by holding up articles. Interchange of gifts. Taxes. Branches as tokens of friendship. Waving of paddles. A green branch. Sprinkling water on head. Use of a dog. A branch. A stick with feathers attached. The South Sea peace offering. Snuff offerings. Curious offer of a pig. Exchange of presents by Andamanese.

V.—Joy weeping among Andamanese. Laceration as a sign of joy at return of friends. New Zealand custom. Joy-weeping practically mourning. A contrary case with an English girl.

VI.—The expression of displeasure. The Malay kiss and Roman *fascies*. The deaf-mute's gesture.

VII.—Various unclassified customs. Spitting a salutation in Africa. Chewing sugar-cane and blowing thereon. Blowing on hands. Spread of handshaking custom. Spread of European and Mahomedan words of greeting. Tribes without salutations. A tribe known by its salutation-word.

P.S.—Mr. Normand's painting, the "Death of the First Born," and kissing and embracing in Egypt."

THE various methods of salutation in use among savages have been treated by Mr. E. B. Tylor—largely in his chapters on Gesture Language ("Early History of Mankind"), and perhaps more fully in the article entitled "Salutations" in the ninth edition of the "Encyclopædia Britannica." Since the above papers were written, further accounts of the customs of saluting have been collected, and these being deemed of sufficient interest, are now laid before the Fellows of the Anthropological Institute.

As in describing other customs, so here in describing those now before us, we find very often races far apart making use of like forms. Such similarity may be accounted for in several ways: by transmission through travellers, by more or less close relationship, or by independent origin. But with this aspect of the customs we have in this paper nothing to do. In describing these customs the groupings, with slight modifications, as arranged by Mr. E. B. Tylor, will be adhered to as much as possible. It is yet not always clear as to which a group or custom may belong. This will be seen in the course of the paper.

I.

The first group embraces in principle those customs which express the act of parties joining in compact, peace, or friendship. The most important of these will naturally be handshaking. At the same time it will perhaps not be inadmissible to introduce into this group all customs where the act is expressed by joining of noses, kissing (joining of lips), or embracing. Sniffing, smelling, or inhaling will thus naturally fall into the group, for these acts cannot be performed with any ease without bodily contact.

In the Friendly Islands, "They salute strangers much after the manner of the New Zealanders by joining noses, adding, however, the additional ceremony of taking the hand of the person to whom they are paying civilities, and rubbing it with a degree of force upon their nose and mouth" (Cook, "Third Voy.," Bk. i, ch. iii). At Otaheite, Captain Wilson remarks, "Their mode of salutation is very different from ours. They touch noses, and wonder that we can express affection by wetting one another's faces with our lips ("Mission Voyage," Lond., 1799, p. 363)." In the Sandwich Islands, Cook ("Third Voy.," Bk. V, chapter iii) speaks of their joining noses as a token of friendship, and not of *rubbing* noses, and Captain King (*ibid*, ch. vii), thinks the fulness of the nostrils of the native may be the effect of their saluting by pressing the ends of their noses together. When we come to consider the way in which this salutation is carried out, Captain King's suggestion does not appear so unreasonable. Captain Beechey thus describes the ceremony:—"The manner of effecting this friendly compact is worthy of description. The lips are drawn inward between the teeth, the nostrils are distended, and the lungs are widely inflated; with this preparation the face is pushed forward, the noses brought in contact, and the ceremony concludes with a hearty rub, and a vehement exclamation or grunt; and in proportion to the warmth of feeling, the more ardent and disagreeable is the salutation" ("Narrative of a Voyage to the Pacific," Lond., 1831, Part I, p. 3). This same authority (*ibid*, p. 242), states that among the Esquimaux, "Their manner of salutation was by rubbing their noses against ours, and drawing the palms of their hands over our faces." Ellis ("Polynesian Researches," sec. ed., 1831, p. 337), and Turner ("Samoa A Hundred Years Ago," Lond., 1884, p. 179), also refer to the touching of noses, and the latter to smelling as well. There must apparently be some real pleasure in this method of salutation if judged from the following account. Williams, on landing at Manono Island in the Navigator Group, says ("Nar. Mis. Voy.," Lond., 1840,

p. 110), "I then introduced Teava and his wife, when he seized them with delight, saluted their noses with a long and hearty rub, and exclaimed, *lelei, lelei, lava*, 'good, very good, I am happy now.'" On another occasion, he says (p. 109), that as the chief esteemed the missionary greater than himself, he only rubbed his nose on his (Williams') hand.

In Astrolobe Bay (New Guinea), "The usual kind of friendship was squeezing the nostrils with the forefinger and thumb of the left hand, and pointing to navel with index finger of right, generally making one or two audible grunts during intervals, and sometimes a word was used like *vācōus*, but this was rare" (Comrie, "Jour. Anth. Inst.," Vol. vi, 1877, p. 108).

From nose rubbing the transition to smelling is not great. St. Johnston ("Camping among Cannibals," Lond., 1883, p. 302), in the interior of Fiji, states, "When I left the house I slept in, those people who were inside said to me, '*Saloka*,' meaning 'you go,' to which I made the proper reply, 'I go, you stay.' One or two of them then took my hand and smelt it, making rather a noise about it, which is here a very courteous and respectful method of salutation and farewell, but a little surprising just at first."

Among the Khyoungtha, Lewin tells us:—"Their mode of kissing is strange, instead of pressing lip to lip they apply the mouth and nose to the cheek, and give a strong inhalation. In their language they do not say, 'Give me a kiss,' but they say, 'Smell me'" ("Hill Tribes of South East India," p. 118).

And on the Gambia, Fr. Moore related last century that usually the people's "manner of salutation is shaking hands, but generally when the men salute the women, they, instead of shaking their hands, put it up to their noses, and smell twice to the back of it" ("Travels in Inland Parts of Africa," Lond., 1738, p. 121).

A unique custom is found in New Guinea, according to W. G. Lawes ("Jour. Anth. Inst.," Vol. viii, 1879, p. 376): "The mode of salutation with the Koiari is peculiar. When I arrived at one of their villages, a chief whom I knew put one of his arms round my neck, and began fumbling about at my neck. I wondered what he wanted, but presently found that he was feeling for my chin. They salute their friends by chucking them under the chin."

Handshaking is common in Central Asia (Vamberg, "Travels," Lond., 1864, pp. 85, 118, 128, and 129). Captain Speke says handshaking is the peculiar custom of the men of Karagué ("Jour. Disc. Nile," Lond., 1863, p. 203). Among the Masai the handshaking, unfortunately for the traveller, leads to other business. Thomson thus describes it ("Through Masai Land,"

p. 300): "For now the Masai are beginning to issue forth with the warming of the air. On all sides we are greeted with '*Shore! Shore!*' (friend). In my case I am addressed as '*Lybon*' (medicine man), to which I reply with an inarticulate sound signifying I am all attention. '*Gusak*' (your hand) is then asked for. The shaking being duly honoured, a further stage in the ceremonious greeting is made by the salutation, '*Sobai*' (how are you), to which I answer, '*Ebai*' (I am well). Then as a corollary to the ceremony, the visitor follows it up with the demand '*Jogon? mashetan!*' (Do you wear a string of beads), and without a demur a string of beads is handed to the stalwart beggar."

This sort of thing is very different from the custom in Wazan, where Watson ("A Visit to Wazan," Lond., 1880, p. 177) refers to his host's shaking hands with him "in the beautiful Mosnili fashion." Among the Wanika, according to Krapf ("Travels," Lond., 1867, p. 138), in shaking hands the chief "first grasped my hand and pressed his thumb against mine, as is the custom."

In connection with handshaking we find other peculiar finger exercises. Thus on the Niger, Blaikie ("Nar. Expl. Voy.," Lond., 1836, p. 44), says at Abo "the ceremony of handshaking is performed by the two parties taking loose hold of the fingers of each other's right hands, and then slipping them, making at the same time a snapping noise with the aid of the thumb."

Lander ("Journal," Lond., 1832, Vol. i, p. 10) complains of being obliged to "shake hands, and crack fingers, and bend our bodies, and bow our heads, and place our hands with solemnity on our heads and breasts." And in the following account of Schweinfurth's, the cracking of fingers is also marked: "Mutual greetings among the Niam-Niam may be said to be almost stereotyped in phrase. Anyone meeting another on the way would be sure to say '*muizette*'; but if they were indoors they would salute each other by saying '*mookernote*,' or '*mookenow*.' Their expression for farewell is '*minahpatiroh*'; and when under any suspicious circumstances they wish to give assurance of a friendly intention, they make use of the expression '*badya, badya, muie*' (friend, good friend, come hither). They also extend their right hands on meeting, and join them in such a way that the two middle fingers crack again; and while they are greeting each other they wave their hands with a strange movement, which to our Western ideas looks like a gesture of repulse. The women, ever retiring in their habits, are not accustomed to be greeted on the road by any with whom they are not previously intimate ("Heart of Africa," 3rd ed., i, p. 292)." Among the Monbutto, says the same author (*ibid*, Vol. ii,

p. 41): "The universal form of salutation consists in joining the right hands, and saying '*Gassiggy*,' at the same time cracking the joints of the middle fingers."

Rebman tells us ("Krapp's Travels," Lond., 1867, p. 238), that during his first journey to Jagga: "When I was summoned to Masaki, my guide put grass into my hands, after the custom of the country, that I might so greet the King, who had likewise some in his. In conformity with their usage I gave my hand to him and to his ministers." Forty years later Thomson met the same custom among the Masais: "They (Masai women) entered with a mincing, half-dancing step, and peculiar motion of the body, chanting a salutation all the time. Each one carried a bunch of grass in the hand, in token of peace and good-will;" and later, "As we pass them in succession we pluck some grass and gravely shake hands. Addressing them as *El-Moran* (Masai warriors), we wait till an inarticulate sound intimates they have ears. Then we say '*Subai*,' to which they reply, '*Ebai*,' and our introduction is over (*op. cit.*, pp. 189 and 167)."

Handshaking appears to have been customary amongst the Trojans. Æneas on meeting his father, Anchises, in the infernal region, says, "Permit me, father, to join my right hand (with thine) (*Ænid*," Book vi)." We have seen above that handshaking was customary on the Gambia, and Fr. Moore (*op. cit.*, p. 121) adds, "And nothing can affront them so much as to salute them with your left hand."

Embracing is common in Central Asia (Vambery). Ellis (*op. cit.*, iv, p. 282) relates a case at Hawai; and in Australia it is most common: "Brothers and friends do not at first notice each other, but gradually draw near, and when alongside throw an arm round each other's necks, and stroll about, saying kind things to each other." But with husbands and wives, even when they love each other, they do not greet on meeting after a long separation (Bonney, "Aborigines of Darling River," *Journ. Anth. Inst.*, xiii pp. 129 and 130). The following, taken from Curr's "The Australian Race" (Melbourne, 1886), show how widely distributed the custom of embracing is on the Southern Continent. The Ballardong tribe: "On meeting, after an absence, friends will kiss, shake hands, and sometimes cry over one another (I, p. 343);" the Wonkomarra tribe: "The members of the tribe salute each other on meeting, after an absence, by throwing their hands up to their heads (II, p. 38);" at Bourke, Darling River: "Two men, not necessarily related, but friendly, when meeting would salute by standing side by side, and casting each of them his nearer arm round his fellow's neck, with the greeting *Kalnnbeeja*, or *bahlooja* (father or younger

brother), according to the age of the addressed (II, p. 205);" on the Mary River, Queensland: ". . . friends meeting after long separation, embrace. On such occasions they seem much affected, rub faces, and caress one another very fondly (III, p. 176)."

From embracing we come to kissing: "Although the Japanese are affectionate, and particularly so regarding their children, they never kiss. There is no such word in the Japanese language (St. John, "Wild Coasts of Nipon," Edin. 1880, p. 224)." In Central Asia, according to Vambéry, it seems common. Tanner ("John Tanner's Narrative," Lond., 1830, p. 54) relates that once during his captivity among North American Indians his adopted mother hugged and kissed him when she was pleased he had killed a bear. On one extraordinary occasion among the Dakota Indians, when Rain-in-the-Face was captured, Mrs. Custer relates: "The officers present could scarcely believe their eyes when they saw his brother approach and kiss him. Only once before, among all the tribes they had been with, had they seen such an occurrence. The Indian kiss is not demonstrative; the lips are laid softly on the cheek, and no sound is heard or motion made. It was only this grave occasion that induced the chief to show such feeling" ("Boots and Saddle," New York, 1885, p. 213). When Livingstone returned to the Malakolo, after his arduous journey to the West Coast, he says of the women:—"Others rushed forward and kissed the hands and cheeks of the different persons of their acquaintance among us ("Missionary Travels," Lond., 1857, p. 492)."

However natural kissing appears to Europeans it has been pointed out by Mr. E. B. Tylor ("Encycl. Brit.," 9th ed.) that the custom of kissing has a very restricted area. In spite of this only a short time ago there was some very serious correspondence in the *Spectator* newspaper, which gravely proved to the satisfaction of the writer that kissing is derived from the mutual licking of the lower animals! Perhaps the writer had in his mind the unpleasant custom found among the Esquimaux, as described by Captain Beechey (*op. cit.*, p. 285): "They were also very particular that everyone of them should salute us, which they did by licking their hands, and drawing them first over their own faces and bodies, and then over ours." But this custom really belongs to another group.

The Biluchis have a very ceremonious form of greeting: "They accost each other with a curious string of inquiries, not only after the health of the individual addressed, but those of his family, and the welfare of his house generally; the *Salaam ulcikum* is only a prelude to the *chungo*, *kullah*? *Kliiar*? *Sullah*? etc. (Are you well, happy, comfortable?), which, when

concluded by one party, must be taken up by the other. In a large assembly, as, for instance, a durbar, these inquiries and rejoinders occupied a considerable space of time, and even after these, if during the interview the stranger's eye caught that of an acquaintance, he would join his hand, and demand inquiringly and earnestly, *Koosh?* (Are you well, or happy?) The Biluchi embrace a friend by laying his hand alternately on each shoulder, and being, as before described, a portly race, the ceremony was trying in so sultry a climate, for each individual of a party exacted this ceremony. In all this, however, there was, beyond the mere ceremonies which in the East are a regular portion of education, and as indispensable as any other occupation of life, a great deal of sociable and kindly feeling, and from the most polished to the rudest of the race, formed a marked feature of character (Capt. T. Postans, "Journ. Ethn. Soc.," I, 1848, p. 123)."

The salutations among the Ainos are peculiarly ceremonious, and are very much like their form of thanksgiving—at least a comparison between the accounts of a thanksgiving ceremony given by Brandt ("Jour. Anth. Inst.," III, 1874, p. 133), reads much like the following, by Lieut. Holland (*ibid.*, p. 236): "The modes of saluting among the Ainos are quite different for men and women. The men rub their hands together, raise them to the forehead, palms up, and then stroke down their beards, one hand after the other; the women draw the first finger of the right hand between the first finger and thumb of the left, then raise both hands to the forehead, palms up, and then rub the upper lip under the nose with the first finger of the right hand. When a man has been travelling and returns home, he and his friend put their heads on each other's shoulder, the elder of the two then puts his hands on the head of the younger, and strokes it down, gradually drawing his hands over the shoulders down the arms and to the tips of the fingers of the younger; until this has been done, neither speak a word. This is rather more familiar a salutation than that of a stranger Aino, who is received by the headman of the village: both kneel down, and the stranger, laying his hands on those of the host, they rub them backwards and forwards; after this, they talk, but neither says a word before the ceremony is completed." Another account is given by H. St. John in "Jour. Anth. Inst.," II, 1873, p. 251.

II.

Cowering and crouching Mr. E. B. Tylor describes as a gesture of fear or inability to resist, common to man and to brutes. In

this group will naturally fall bowing and its converse, the extension of the arms similar to benediction. It also necessarily includes some very self-abasing, to our ideas at least, customs so common in Africa.

The inhabitants of Hainan have a graceful way of greeting a guest, "which is done by extending the arms, placing the open hands with the finger tips touching, or nearly so, and drawing them inwards with an inviting motion. They bid farewell in a similar graceful fashion, extending the open hands with the palms upward and slightly inclined outward, in a movement as if handing one on his way. In giving a present the gesture of greeting is used, signifying their desire to do you a favour, while in receiving a gift the gesture of departure is used in a deprecating way, to express their unworthiness to receive it. I often noticed when people from other villages came, how particular they were to give them the proper greeting, while among those who were more familiar with each other, or met more frequently, the elaborate and graceful form degenerates into a simple quick movement of the hand (C. B. Henry, "*Ling-Nam*," London, 1886, p. 428)."

According to Cameron ("*Across Africa*," Lond., 1877, I, pp. 226-7), among the Uvinza, east of Tanganyika: "When two 'grandeess' meet, the junior leans forward, bends,, and places the palms of his hands on the ground on each side of his feet, whilst the senior claps his hands six or seven times. They then change round, and the junior slaps himself first under the left armpit, and then under the right. But when a 'swell' meets an inferior, the superior only claps his hands, and does not fully return the salutation by following the motions of the one who first salutes. On two commoners meeting they pat their stomachs, then clap hands at each other, and finally shake hands. These greetings are observed to an unlimited extent, and the sound of patting and clapping is almost unceasing." Serpa Pinto found something similar on the West Coast, where the people saluted him "by repeatedly striking their open palms upon their naked breasts ("How I crossed Africa," I, p. 397)." Blaikie ("*Narr. Expl. Voy.*," Lond., 1856, p. 190) found the clapping of hands as a sign of welcome a very common custom on the Niger, and Thomson ("*To the Central African Lakes*," Lond., 1881, I, p. 318) gives us the following lively account of an African morning, where clapping was customary among the Walunga to the west of Tanganyika: "The ceremonious salutations in the morning are surprising. On every side a continuous clapping of hands goes on, with the accompaniment of '*Kwi-tata, Kwi-tata?*' which is their mode of saying 'How d'ye do?' As each appears outside of

his house, he needs must turn to every one singly, and bowing politely, clap hands with the accompanying words. If a relative or some very great friend appears, they at once rush into each other's arms, while if a chief passes, they drop on their knees, bow their head to the ground, clap vigorously, and humbly mutter *Kwitata, Kwitata?*" The Esquimaux clap their hands, extend their arms, and stroke their bodies repeatedly, which Beechey found to be the usual demonstrations of friendship among them. (*op. cit.*, p. 252). Thomson also (*op. cit.* II, p. 199) describes the custom of raising the hands as follows: "The greeting interchanged between our Wajiji boatmen and the strangers (also of Wajiji) was most pleasant and touching. They all stood up with hands closed, and held out in the manner of supplication, then with solemn faces they bent slightly to one side, and repeated in a low key the salutation, *Wukhé wakhé?* (How art thou?), finishing off with clapping the hands once or twice. As each one in our boat was thus saluted personally by all those in the other boats simultaneously, it was some time before they had finished." McNair found a similar custom among the Malays ("Perak and the Malays," Lond., 1882, p. 237): "The Malay is ever 'ready to greet his fellows in the peculiar manner adopted in the country, where the new comer or visitor approaches his host, or the man he wished to salute, with his hands joined as if in supplication, while the other touches them lightly with his own on either side, and afterwards raises his hands to his lips or forehead (the custom of nose-rubbing has been attributed to the Malays in their greetings, but it has never been seen by the writer)."¹ At Easter Island, Cook saw something similar: "A chief saluted some natives as he came up by stretching out his arms, with both hands clenched, lifting them over his head, opening them wide, and then letting them fall gradually down to his sides" (*Sec. Voy.*, Bk. II, ch. viii). Baker ("Albert Nyanza," Lond., 1866, II, p. 27) was greeted as follows at Shooa: "Each native that was introduced performed the salaam of his country, by seizing both my hands and raising my arms three times to their full stretch above my head."

A nasty custom, and limited to Africa, is that of besmearing oneself with mud. It is thus described by Livingstone ("Mission Trav.," Lond., 1857, p. 276). Among the Barotze, the chief, while speaking, during every two or three seconds of the delivery, "picked up a little sand and rubbed it on the upper parts of his arms and chest. This is a common mode of salutation in Londa, and when they wish to be excessively polite they bring a quantity

¹ Wallace, nevertheless, on leaving Macassar, refers to "nose-rubbing" (the Malay kiss), and some tears shed (Malay Archipelago, chap. xxviii).

of ashes or pipe clay in a piece of skin, and, taking up handfuls rub it on the chest and upper front part of each arm; others in saluting drum their ribs with their elbows, while others still touched the ground with one cheek after the other, and clap their hands. The chiefs go through the manœuvre of rubbing the sand on the arms, but only make a feint at picking up some." The same traveller records the same custom as obtaining among the Balonda (*ibid.*, pp. 286 and 296). Cameron found it on the West Coast of Tanganyika (*op. cit.*, p. 299), and Thomson gives another account of it ("Central African Lakes," II, p. 152): "The Wana have a curious resemblance in many respects to the Monbuttoo, discovered by Schweinfurth near the Welle. Their mode of salutation is most elaborate. An inferior in saluting a superior takes a piece of dried mud in his right hand; he first rubs his left arm above the elbow and his left side; then throwing the mud into his left hand, he in like manner rubs the right arm and side, all the time muttering away inquiries about their health. In making speeches the speaker always commences with the same salutation, and each time the chief's name is mentioned every one begins rubbing his breast with mud." It seems indeed common right across Africa, for Serpa Pinto found it among the Ambuellas: "They commenced vigorously clapping the palms of their hands together, after which, scraping up a little earth, they rubbed it on the breast, and repeated many times, in a rapid way, the words *bamba* and *calunga*, terminating with another clapping of hands, not quite so vigorous as before (*op. cit.*, I, p. 333)." Baikie (*op. cit.*, p. 114) met this custom on the Niger, and these are his words: "The form of salutation, when an inferior presents himself, is by kneeling down, bending the head towards the ground, throwing dust against the forehead and on the head, and repeating some words of greeting, which ceremony, if the comer be of sufficient consequence, is repeated by the other party. But if two friends meet on the road they merely shake hands or embrace each other." The Landers also mention the mud custom (*op. cit.*, I, p. 132).

Mr. Theodore Bent states ("The Cyclades," Lond., 1885, p. 469) at Amorgos: "Our priest on entering his father's house, touched the ground with his fingers, as a token of respect, before embracing him. His sisters, on the contrary, touched the ground with their fingers before kissing the proffered hand of their brother. This mode of greeting a priest is common now only in primitive society in Greece, as is also the old way of greeting by placing the hand on the breast and inclining forward, as you say, *Καλῶς ὀπίσσετε*. Sometimes even you may still see the Turkish fashion carried out, of putting the hand first to the lips and then to the forehead."

Among the Todas we have a most peculiar form of greeting, being very like a modification of the salaam of the East. It is performed "by raising the thumb edge of the right hand vertically to the nose and forehead, is a respectful form of address, used in addressing superiors and on approach to sacred places, and other like occasions. When asked by what name they styled that form of salute, they replied . . . 'I say, come! I say, Lord!' When friends meet or pass one another they say *Tya* or *Tcha*, as much as to say, 'Good morning.' The salute called *Adabuddiken*, or, 'I seize the foot,' is performed when people meet who have been apart for some time. Men never bow down to women, nor to other men, but women do so to other women, but not to their husbands, although they do so to father-in-law, mother-in-law, and husband's eldest brother. Now each one of the juniors or inferiors—being a female—approaching each of the superiors or seniors, both men and women in succession, falls at his feet, crouches on the ground before him or her, on which he or she places first the right, then the left foot on her head. Such is the act styled *Adabuddiken*." As this reciprocal ceremony has to be performed by every superior to every inferior, while the superiors among themselves say *Tcha* to every individual, it takes a long time to perform. He says there is no unseemly slavishness about the act, although it is carefully gone through with cheerfulness by the women, and politeness by the men. (W. E. Marshall, "Travels," Lond., 1873, p. 41.)

"In Siam they squat down with their hands crossed, and their heads hanging down with an abashed air" (Neale's "Residence in Siam," Lond., 1852, p. 70). But judging from other evidence in the book, this is probably only done by inferiors to their social superiors and not amongst the people themselves.

Perhaps the most charming of salutations is that of the Japanese: "No people could be kinder, or more polite, amongst themselves, than the Japanese. Two coolies—the lowest class of society—on meeting, never fail to go through the usual custom in the country, of bowing several times, and asking after each other's health, then that of their families, and so on. Little children act towards each other just in the same way, or if an old grey-headed man meet a little girl six years old, the same ceremony is gone through. Two Musumees coming across each other, bow and go through the most engaging and pretty way of saying good morning" (H. St. John, "Wild Coast of Nipon," p. 215).

Among the more civilised peoples affirmation is very commonly expressed by the gesture of nodding the head. But in New Zealand the motion of the head is exactly reversed: "The natives in giving assent to anything, elevate the head and chin

in place of nodding acquiescence" (A. S. Thomson, quoted by Mr. E. B. Tylor, "Early History," p. 52). Strange as it may seem, the custom is not rare at home, and the writer can name four persons in Yorkshire who give an affirmation in the same way as the New Zealanders.

III.

The uncovering of particular portions of the body is described by Mr. Tylor as a sign of disarming, defencelessness, or destitution, and it may be somewhat allied to the last above-mentioned group. The uncovering of a portion of the body, apart from the head only, as a mark of respect appears to have been confined to the natives of Otahaite. Cook refers to this uncovering on several occasions. He says, "What is meant by uncovering is the making bare the head and shoulders, or wearing no sort of clothing above the breast" ("Sec. Voy.," Bk. I, ch. xi). But on his First Voyage he appears to have met with a different sort of uncovering at Otahaite, thus (Bk. I, ch. xiv):—"As a mark of respect to superiors, these people uncover their heads and bodies as low as the waist, and as all parts are here exposed with equal indifference, the ceremony of uncovering it from the waist downwards, which was performed by Oorattooa, might be nothing more than a different mode of compliment adapted to persons of a different rank." Elsewhere Captain Cook says the Tschuksi "were so polite as to take off their caps and make us low bows" ("Third Voy.," Bk. III ch. ix). In Fiji, St. Johnston (*op. cit.*, p. 304) says some natives doffed their turbans to him, but judging from the incident which preceded this salutation, it is doubtful whether this doffing was a usual custom. In juxtaposition to the method of salutation by taking off the head gear, we have the following in Morocco: "When you make calls you keep your head covered, but uncover your feet" (R. S. Watson, *op. cit.*, p. 159).

In the time of the Tudors it appears to have been the custom in England, when a gentleman lost his bonnet, for all those who were with him to doff theirs. It was the omission on the part of his followers to conform to this custom which partly foretold to Thos. Cromwell that he was about to fall into disgrace ("Chronicle of K. Henry VIII," quoted in *Athenæum*, Feb. 19, 1889, p. 208).

IV.

A very common custom is that of holding up some article as an expression of goodwill. Perhaps further evidence than we are able to produce here at present may result in

showing that this was the origin of mutual interchange of gifts, which travellers have come at last to look upon as a species of heavy tax.

In the Navigator Group, "the sign of peace to strangers is the displaying of a white flag or flags; at least such were displayed to us when we first drew near the shore. But the people who came first on board brought with them some of the pepper plant, and sent it before them into the ship" (Cook, "Sec. Voy.," Bk. II, ch. iii). In the same group, "when the natives, previous to the massacre, enticed the Frenchmen into the cave, they threw into the sea, in token of peace, several branches of the tree from which they obtained their inebriating liquor" ("La Perouse, Voy.," Lond., 1807, III, p. 87). In the Admiralty Islands, Mr. H. N. Moseley tells us: "On the first canoes approaching the ship, paddles were held up and waved to express friendship" ("Jour. Anth. Inst.," VI, 1877, p. 396). From exhibiting the token is but a step to its presentation, and thus we find in the New Hebrides, "As signs of friendship they present a green branch, and sprinkle water with the hand over the head" (Cook, "Sec. Voy.," Bk. III, ch. iii). A very similar custom is found at the present day in Astralobe Bay, New Guinea, where also on other occasions a dog was brought alongside, and its brains dashed out by taking it up by the hind legs and striking the head against the ship's side, while higher up the coast, waving branches of some kind of palm, and sprinkling the head with sea-water, was the equivalent for peaceful intentions. On all these occasions the herald put on a smile, childlike and bland" ("Jour. Anth. Inst.," VI, 1877, p. 108). Cook also believed that in New Zealand the offering of a branch was an emblem of peace ("First Voy.," Bk. II, ch. i). The same navigator tells us that at Kayes Island (North America) "the natives had a stick about three feet long, with the large feathers or wing of some birds tied to it. These they frequently held up to us, with a view, as we guessed, to express their pacific disposition" ("Third Voy.," Bk. IV, ch. iv). Williams describes this *utu*, or peace-offering, as common in the Pacific, to consist "in presenting to the visitor a bread fruit, a piece of cloth, or some other article with the sacred cocoa-nut leaf, which they call *Tapauu*, attached to it, on receiving which the stranger returns some trifle as a token of amity" (*op. cit.*, p. 77).

Holub ("Seven Years in South Africa," Lond., 1881, Vol. ii, p. 316) describes a custom he met with among the Marutze, which reminds us much of our grandfathers: "There is one form of salutation to a stranger which is observed by every householder, from the king downwards. After a few words have been exchanged, the host produces a snuff-box that hangs from his

neck or his waistband by a strap, or from his bracelet, and having opened it, offers it to his guest, though sometimes, instead of passing the box, he empties the contents into his own left hand, from which he takes a pinch himself, and then extends his half-open palm to those about him." Among populations we generally look upon as civilized, an offering of welcome or of peace is still made to the stranger; it is thus described by Theodore Bent (*op. cit.*, p. 498): "As he (our host) brought it (the pig) into the house, he made a curious obeisance and placed the pig at my feet, saying as he did so, a little distich, 'I have brought you a little pig, red, red as your beard,' and noticing my astonishment at the absence of any red beard, Papa Demetrious explained that this was a customary way of offering a like present to a guest whom they wished to honour."

Amongst the Andamanese (E. H. Man, "Jour. Anth. Inst.," 1882, pp. 287, 288): "Contrary to the practice among most nations, no salutations are exchanged between friends on meeting after a lengthened absence; but when time is no object they remain speechless, gazing intently at each other for sometimes as much as half-an-hour; the younger of the two then makes some commonplace remark which breaks the ice, and they lose no further time in hearing and telling the latest news. It is usual for them also to exchange such things as bows, arrows, nautilus shells, &c., which may happen to be in their hands, when they meet, and such gifts are regarded as proofs of affection."

V.

Joy-weeping is perhaps the most curious of all these customs, and has been noticed among the Andamanese, the Tahitians, and New Zealanders. Amongst the Andamanese, according to E. H. Man ("Jour. Anth. Inst.," XII, 1883, p. 175): "Relatives testify their joy at meeting after a few months' separation by throwing their arms round each other's necks, and sobbing *à chaudes larmes* as if their hearts would break. This to us somewhat incomprehensible proceeding is inaugurated by the women, but the men are not long in following suit, and groups of three or four may be seen as if vying with each other in the loudness of their lamentations of rejoicing until fairly worn out. The day is then wound up with the inevitable dance and song."¹

Among the Tahitians, "the custom of cutting themselves with shark's teeth, and indulging in loud wailing, was a singular

¹ In the photo, of the two relatives weeping as described, one is sitting on the other's lap.

method of receiving a friend, or testifying gladness at his arrival; it was, however, very general when Europeans first arrived" (Ellis, *op. cit.*, II. p. 337). And in New Zealand, R. Burn, after referring to the custom of *ongi*, or nose-pressing, says: "But if you were a person of any consequence, or one much beloved, they used to add to it by what they call the *tangi*, which was cutting the face, breast, and arms with a piece of lava or mussel shell, and giving utterance to a series of the most lamentable howls, whilst forced tears rolled down their bloody cheeks" ("Brief Narr. New Zealand Chief," Kendal, 1848, p. 22).

Mr. E. B. Tylor ("Encycl. Brit.," 9th ed.) objects to this joy-weeping that it practically is mourning—mourning for those who are dead in the interval of separation. Joy-weeping is very common among Europeans, and such cases occur as the reaction after excessive pain or misfortune. But there is probably such a thing as genuine joy-weeping, and such a case lately came under my notice. It was that of a young lady who could not possibly have any notion of the suffering, and who on seeing her baby sister for the first time, could only express by weeping her happiness at having a sister.

VI.

Salutations may also express displeasure instead of welcome. Thus among the Malays the kris is considered "an almost indispensable article of his dress: the Malay always wears his kris on the left side, where it is held up by the twisting of the sarong, with which during an interview it is considered respectful to conceal the weapon, and its handle is turned with its point close to the body if the wearer is friendly. If, however, there is ill blood existing, and the wearer be angry, the kris is exposed, and the point of the handle turned the reverse way" (McNair, *op. cit.*, pp. 245, 298). From the kris exposed to "daggers drawn," is but a movement.

This reversing of the kris reminds one of the Roman *fascies* carried in procession, and is similar in action to the deaf-mute's gesture for expressing the presence of a friend by putting the two fingers to the *right* side of the nose, but on the *left* side to indicate an enemy.

VII.

There remain a variety of customs which cannot well be grouped, and which are therefore placed here all together.

In Africa we have the disgusting practice of spitting on the person towards whom the spitter is well-disposed. Schweinfurth,

describing the Dyoor, says, "In recent times they have lost some of their ancient habits; for instance, the practice of mutual spitting, which was long the ordinary mode of salutation, has fallen into disuetude. Throughout the entire period of my residence in Africa I was never a witness of it more than three times; and in all three cases the spitting betokened the most affectionate goodwill; it was a pledge of attachment, an oath of fidelity; it was to their mind the proper way of giving solemnity to a league of friendship" (*op. cit.*, I, p. 79). James Thomson ("Through Masai Land, London," 1885, p. 290) tells us: "With them (the Masai) it (spitting) expresses the greatest goodwill and the best of wishes. It takes the place of the compliments of the season, and you had better spit upon a damsel than kiss her. You spit when you meet, and you do the same on leaving. You seal your bargain in a similar manner."

Du Chaillu met with a custom, somewhat similar to the above in one respect, but far pleasanter in another. He says (p. 430), that on parting from Olenda "he took a sugar cane, bit a piece of the pith, and spat a little of the juice in the hand of each one of the party, at the same time blowing on the hand. Then he said solemnly, 'Let all have good speed with you, and let it be as smooth (pleasant) as the breath I blow on your hand.' Then Minsho received the cane which he is to bring back." And again (p. 393), "Quengueza's men, Ranpano's, and mine gathered before the old king, who solemnly bade us 'God speed,' taking my two hands in his and blowing upon them as their custom is, saying, 'Go thou safely and return safely'" ("Explor. and Adv. in Equatorial Africa," Lond., 1861).

Finally, like other customs and other forms of salutations, as, for instance, handshaking (E. B. Tylor's "Early History," p. 45), which has been introduced by travellers, so do greetings by word of mouth get carried about. Thus when Livingstone was on his way to Loanda, he thought the people in Katema's village had imported something from the Mahommedans, and more especially as an exclamation of surprise, 'Allah!' sounds like the 'Illah!' of the Arabs; but he found a little farther on another form of salutation of Christian (?) origin, "Ave-rie" (Ave Marie). As he remarks, "The salutations probably travel further than the faith" ("Mission Travels," Lond., 1857, p. 321).

The only positive statement as to a race appearing to be without salutations or greetings of any kind is said of the Kumi and Lhossai (Lewin, *op. cit.*, pp. 230, 256), while in Korea, as an author (H. St. John, "Wild Coasts of Nipon," p. 245) tersely puts it: "They have no salutations except buffetting each other," which, according to our notions, is certainly a doubtful way of bidding one welcome. One tribe, the "Edeeyah, have

mostly been spoken of, by such persons as have seen them, under the name of Būbīs, from their usual salutation, on meeting a stranger, of Būbī, the Edeeyah term for friend" (Dr. T. R. H. Thomson, "Jour. Ethn. Soc.," I, 1848, p. 106).

P.S.—Since the above was compiled a striking but painful picture entitled the "Death of the First-Born," has been exhibited at the Royal Academy, by Mr. Ernest Normand. In this picture, the manner in which the mother is embracing her dead child, and also the closeness of her face to the dead face, give her the appearance of being about to kiss the child. If this is so, on what authority does Mr. Normand make out that kissing or even embracing was an Egyptian custom?—I can find no reference to either kissing or embracing in Wilkinson.

MAY 28TH, 1889.

FRANCIS GALTON, Esq., F.R.S., *Vice-President, in the Chair.*

The Minutes of the last meeting were read and signed.

The following presents were announced, and thanks voted to the respective donors:—

FOR THE LIBRARY.

From the SECRETARY OF STATE IN COUNCIL OF INDIA.—A Manipuri Grammar, Vocabulary, and Phrase Book, to which are added some Manipuri Proverbs, and specimens of Manipuri Correspondence. By A. J. Primrose, C.S.

— A short account of the Kachcha Naga (Ēmpēo) Tribe in the North Cachar Hills, with an Outline Grammar, Vocabulary, and illustrative sentences. By C. A. Soppitt.

— A short account of the Kuki-Lushai Tribes on the North-East Frontier, with an Outline Grammar of the Rangkhoh-Lushai Language, and a comparison of Lushai with other Dialects. By C. A. Soppitt.

— Outline Grammar of the Angāmi Nāgā Language, with a Vocabulary and illustrative sentences. By R. B. McCabe, C.S.

— Outline Grammar of the Lhōtā Nāgā Language, with a Vocabulary and illustrative sentences. By Rev. W. E. Witter, M.A.

— Outline Grammar of the Kachári (Bārā) Language as

- spoken in District Darrang, Assam, with illustrative sentences, Notes, Reading Lessons, and a short Vocabulary. By Rev. S. Endle.
- From the SECRETARY OF STATE IN COUNCIL OF INDIA.—Outline Grammar of the Shai'yâng Miri Language, as spoken by the Miris of that Clan residing in the neighbourhood of Sadiya; with illustrative Sentences, Phrase Book, and Vocabulary. By J. F. Needham.
- From the DEUTSCHE GESELLSCHAFT FÜR ANTHROPOLOGIE, ETHNOLOGIE, UND URGESCHICHTE. Correspondenz-Blatt. 1889. No. 4.
- From the BATAVIAASCH GENOOTSCHAP VAN KUNSTEN EN WETENSCHAPPEN.—Nederlandsch-Indisch Plakaatboek, 1602-1811, door Mr. J. H. Van Der Chijs. Vijfde Deel, 1743-1750.
- Algemeen Reglement en Reglement van Orde.
- Notulen van de Algemeene en Bestuurs-Vergaderingen. Deel xxvi, Afl. 3.
- Tijdschrift voor Indische Taal-, Land-, en Volkenkunde. Deel xxxii, Afl. 5.
- From the ACADEMIA CAESAREA LEOPOLDINO-CAROLINA GERMANICA NATURAE CURIOSORUM.—Nova Acta. Vol. lii.
- Biographische Mittheilungen und Nekrologe. 1881-1887.
- From the AUTHOR (through W. Whitaker, Esq.).—On the Discovery of Palæolithic Implements in the neighbourhood of Kennet, Cambridgeshire. By Arthur G. Wright.
- From the ACADEMY.—Kongl. Vitterhets Historie och Antiquitets Akademiens (Stockholm) Månadsblad. 1887.
- From the INSTITUTION.—Journal of the Royal United Service Institution. No. 147.
- From the YORKSHIRE PHILOSOPHICAL SOCIETY.—Annual Report for 1888.
- From the SOCIETY.—Journal of the Society of Arts. Nos. 1904, 1905.
- Bulletin de la Société Neuchateloise de Géographie. Tome iv. 1888.
- From the UNIVERSITY.—The Journal of the College of Science, Imperial University, Japan. Vol. ii. Part 5.
- From the EDITOR.—The American Antiquarian. Vol. xi. No. 3.
- Nature. Nos. 1020, 1021.
- Science. Nos. 326, 327.
- Revue d'Anthropologie. 1889. No. 3.
- Revue d'Scientifique. Tome xliii. Nos. 20, 21.

Major-General PITT RIVERS, D.C.L., F.R.S., Vice-President, exhibited and described several skulls and other bones, found by him in the course of recent excavations at Hunsbury Camp, near Northampton, and at a Roman Villa at Llantwit, near Cardiff. The description of these remains will appear in a subsequent number of the Journal.

The following Paper was read by the Author:—

NOTES on the HYKSÔS or SHEPHERD KINGS of EGYPT.

By the Rev. HENRY GEORGE TOMKINS.

THERE is much likeness in the general condition of those two great focal points of life in the first empires—the head of the Persian Gulf and the delta of the Nile.

At the earliest time of which we have any evidence the one region, like the other, was occupied by a great mixture of peoples, and the Pharaohs of the old empire had to fight on the west with the fair Libyan races, and on the east with the wandering Menti, Sati, Shasu, Heru-sha, Nemma-sha, and the like.

The thirty-seven Amu or Semitic foreigners depicted on the wall of a tomb at Beni-Hassan are rightly renowned as the earliest of such immigrants known to us by any graphic record. But we must not overlook the similar group on an early Chaldaean seal-cylinder, engraved by Layard, and elsewhere. Here we see the start, as in Egypt the arrival, of such a clan; and this is very much to our purpose; for these also are kilted nomads with bow and quiver, wife and children; the men are bearded and aquiline in feature like the Amu of Beni-Hassan.

The westward drift from Central Asia in the third and second millennia before Christ is one of the most striking facts of the earliest history. There were two great streams, the one up and across the Euphrates, then through Syria and Western or Eastern Palestine, the other from the Persian Gulf across Arabia to the Red Sea, and across the Straits to Somâliland and Abyssinia and down the Nile.

The invasion of the Hyksôs evidently came by the former channel, and the main movements which controlled the destinies of Chaldaea and Assyria on the one hand, and of Egypt on the other, were conducted on this great curve.

Professor Maspero is quite right, I believe, in tracing this conquest to impulses which set in from the Elamite region beyond the Tigris.

Not simply tribes of Bedâwin nomads were the aggressors, but potentates of the stamp of Kedorlaomer or the Hittite lords of later date; so that we must not expect to meet with the traces of a single race or leading family of men. In truth the leading and ruling race would be the energetic few, lording it (as ever) over the hordes of weaker sort, weaker, that is, in imperial energy, but strong in sinew and in arms. It is rather the question

of this ruling race that we can deal with than that of the "mixed multitude."

The name Hyksôs (King of the Shasu, or nomad plunderers), we receive from Manetho. But it does not follow that the lords of the Shasu were men of their own race.

In order to warrant some opinion on this matter let me lay before you:—

1. The proper names as they have reached us through historians in the Greek language and otherwise, and in the monumental records.
2. The characteristics of the statuary attributed to the Hyksôs rulers.
3. The religion of these masters of Egypt.
4. Then we will rapidly sketch the history, and see what after-light is given by the brilliant course of counter-conquest of the XVIIIth dynasty.


It is much to be regretted that the monumental names are so imperfectly or oddly executed (for the most part), or so much defaced, and in the Turin papyrus so fragmentary, and in the Greek transcripts so variant, and hard to identify.


The names Salatis and Saïtes given for the earliest ruler would seem intended for the name of the Hyksôs god Set, or Sutekh, and the Semitic title Shallit, שלית, which was borne by Joseph, according to Gen. xlv, 6. It is interesting to find the same title in effect given by the Assyrians to the Pharaoh long after, namely, *Shiltannu*, whence "Sultan" (Lenormant, "Hist.," 9 ed. II, 147). If the reading, Set Shallit, on the statue of Tel-Mokdam, is correct, it will exactly agree with Saïtes Salatis, the epithet, "Lord of Ha-uar," which he bears being also quite in agreement with Manetho's narrative of the great intrenched camp which Salatis formed at the city of that name; a name, however, already in existence, as is shown by a broken statue of Amenemhat II, of the XIIth dynasty, found at Sâh. But the reading of the inscription is disputed. The name Salatis is corrupted by Herodotus or his copyists into Philitis, as it would seem, for he has preserved a vague tradition of the "shepherds" at Memphis.

The next name is Buôn, Βυών, of which there is no explanation offered except one or two guesses which Wiedemann rejects as "phantastisch" (Ebers, "Aeg. und die B.M.," 203; Wiedemann, "Supp." 32).

The third name, Ἀπαχνάς, or Παχνάν, may involve the name כנעני, and mean the "Canaanite" (Lauth, "Chronol.," 137), a guess which to my mind is not unlikely.

Next comes an Ἀπωφίς, a well-known name in Egyptian

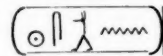

records, , which is inscribed on the right shoulder of the celebrated sphinxes of Sâh, and written in the papyrus Sallier I, with the attribute "beloved of Sutekh," or the like.

Two Hyksôs kings at least bore the name Apepi. The throne-name of one, Râ-âa-us, , is found on a palette in the

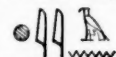
Berlin Museum discovered in the Fayûm (Eisenlohr, "Proc. S.B.A.," 1881, p. 97), and the celebrated mathematical papyrus Eisenlohr bears date the 23rd year of his reign. His name is also on a table of offerings at Bûlaq. But it is the other Apepi, Râ-âa-ḡenen (or Râ-ab-taui), whose name is on the statues of Mermashai (Petrie, "Tanis," Insc. 17 c., Plate XIII, 6), and has been read by Wiedemann on the pedestal of a broken statue at the Louvre which bears an inscription of Amenhotep III ("Aeg. Gesch.," 294). But Miss Edwards tells me that she could not read it there a little while ago, viz., in 1886.

The fifth Shepherd-king on the list of Manetho's XVth dynasty as given by Josephus, is 'Iavvas, 'Avvas, apparently the same name as that of 'Iavvîs, Iannes who withstood Moses.

A magician in the Delta in the time of that great patron of magic, Merenptah, may well have borne a Hyksôs name and have been a devotee of Sutekh. I do not know that this name has been found on any monument until this spring, when M. Naville discovered among the ruins of a temple at Bubastis the lower part of a statue consisting of the throne and legs of a Pharaoh

with the name inscribed:  , which gives us Râ-ian (or Ian-Râ) with a throne-name worthy of notice.




This at once suggests the Iannas of Manetho, and on the other hand it was at once identified by a Mahommedan official with the Reiyân, son of El-Welid, whom the Arab writers call the








Pharaoh of Joseph. But there are scarabs which read 

and therefore this may be the name, i.e., 'Avvas, or IANNAΣ, with rough breathing. Indeed, it is now pretty clear that this is the true reading of the name; see the letters of Mr. Griffith and Mr. Petrie in the "Academy" of August 25th, and my letter in the "Academy" of September 1st of this year, in which I have shown reason for identifying the name Khian with Khaian, a name borne by a king of Khindani on the west side of Euphrates, south of the junction of the Khabûr, in the time of Assurnazirpal, and by another prince, the son of Gabbari, who dwelt at the foot of Khamanu, that is, the Amanus range north-west of Syria.


There is a Tell Khaïa, south of Kharran, at the head of a tributary of the Belikh River, which may be connected with this name.

As regards the throne-name, it is clearly identical with the cartouche on the breast of the little grey granite lion (or sphinx) from Bagdad, in the British Museum, as Mr. Griffith very well observed, and I am very glad that M. Naville agrees in this ("Academy," 1888, pp. 384, 420, 432, 453).

This cartouche has been variously read. M. Naville, however, reads it (he tells me) User-n-Ra, though the  is placed on the right side, it is the complement of the sign , written here 

He adds, "there is a king (  )" quoted by Brugsch in his 'Livre des Rois,' from the papyrus of Turin." And we must compare the throne-name of the former Apepi just mentioned. (   )

The finding of the Hyksôs monument and other Egyptian relics in Assyria, of Egyptian antiquities at Arban on the Khabûr, and of the cuneiform tablets at Tel el-Amarna in Upper Egypt, furnishes interesting matter for inquiry. But we now come to the last name in our Greek list of Hyksôs sovereigns of this first Shepherd dynasty (viz., XVth dynasty), that is, Στραόν, which I take to be a variant reading of Ἀσσήθ = An-Set or Set-an, the name of the Hyksôs god Set with the addition of the name of Heliopolis, *An*.

Prof. Sayce has a scarab which appears to bear the name Set-An . The second sign is equivalent to the name of Heliopolis.

II.—The statuary assigned to Hyksôs kings has been often described. It is most interesting and marked by special characteristics of its own, and seems naturally to fall into two divisions, corresponding with what we know of the history of these rulers, the former having the strong and rugged marks of native genius, the other an Egyptian style and softened aspect.

To the former class belong the grim sphinxes of Sân, with a great shaggy lion's mane right up to the face instead of the Egyptian royal head-dress, yet having worn the Pharaonic uræus serpent in metal above the forehead, and with the fillet showing in front, and the artificial beard.

To the same class belongs the remarkable statue from the Fayûm, with artificial beard, and huge wig, elaborated into twice as many curls down the sides as those which cross the head,

and we must believe that the golden uræus rose from the socket-hole which indents the front. A narrow belt crosses diagonally from the left shoulder, and over this hangs a crescent-shaped ornament on the breast which is worthy of notice. This king was clad in the sacred robe of panther's skin after the Egyptian style, with the head of the animal showing in front on the left shoulder, and a foot with claws on the right. This is a highly significant token of initiation into the religion of Egypt. The statue was found among the ruins of Crocodilopolis, the city of the god Sebek.

In the Ludovisi collection at Rome Lenormant identified a head as evidently belonging to the same type. This also has a huge wig of thick spiral tresses falling in front and down the back, and it has the special feature of a great plaited pigtail falling below the wig.

It has not the Egyptian beard, but a broad beard of close regular curly hair in parallel curves from the chin downwards. In this it closely resembles the next example, and it seems to have no royal serpent in front.

Next we have the strange twin-statues, standing behind tables which are decorated with lotus-stems and the pendent flowers, and on which large fishes are deposited, while some of the geese of the marshes are suspended at the front and sides. These figures are scantily clad in the linen *shenti* from the hips, and have no ornament visible, but the upper part of the heads and the faces are much broken. Their wigs and beards are of the same style that marks the Ludovisi head. The countenances of all these are of a type that cannot be mistaken. It is altogether alien to the rounded features and winsome cheery expression so familiar in Egyptian royal faces.

The visage is strong, broad, and ample, marked by prominent cheek-bones, and a special muscular fulness about the mouth; the lips prominent but very expressive, and channelled down the upper lip; the chin well-rounded; the nose somewhat sub-aquiline, and nostrils wide. The expression is intelligent, stern, and sad, and full of determined power.

Our second class of this type is not so well illustrated. It is simply Egyptian in attire, and at present I can only speak of two fragments. One is the beautiful colossal head found by M. Naville this year at Bubastis, near to the remains of a doorway bearing the titles of Apepi of the later date, and supposed to belong to a statue of that monarch. It has the Egyptian head-dress called *nems*, and the Pharaonic uræus. The face is most interesting, for it is a refined and dignified version of the type of the Sān sphinxes.

The countenance is of square frame, with high cheek-bones,

the cheeks themselves rather sunk, the mouth and lower jaw prominent, but well-formed, and the chin finely rounded up to the slightly projecting lower lip, with a very firm, but not surly, look. The nose, rather injured, is handsomely formed and well-proportioned; the eyes, well apart, are denoted by cavities intended for the wonderful work in some different material which only Egyptian artists would employ, but in the absence of their orbits there is a proud and calm expression of intellect.

We see in this fine face something of Egyptian serenity, but without the attractive cheer of that well-favoured nation. This Apepi of Bubastis is an inestimable treasure in the sculpture-gallery of Egypt, and seems to me as high an example of its own type as the beautiful heads of Seti I. have given us of another so different.

In reply to some inquiries, M. Naville has kindly sent me some information in detail. He writes:—

"1. The inscription on the doorway of Apepi is merely his second cartouche, very large, I should say about $1\frac{1}{2}$ foot high, and a few doubtful signs. It has not been photographed, but you see it behind the statue of Raian, in the photograph made by Brugsch which I sent to Miss Edwards from Egypt.

"2 and 3. Thesecond head, mentioned in a foot-note ('Academy,' 1888, p. 263), is that of which you have the photograph. It is nearly perfect; there is only a little bit of the nose broken off. The first head is broken in two at the height of the eyes; the type is the same; however, I believe that the cheeks are a little fuller. I believe that both these statues, which were of the same size, represented Apepi, and that it was his cartouche which was engraved along the leg, and which has been twice erased."

[The broken head, and I suppose the other, is of black granite.]

"At present I know only of two Apepi, and the most powerful must have been the second."

M. Naville has since kindly sent me a photograph of this grand colossal head in true profile, which quite confirms the opinion that it is a highly refined version of the sphinxes of Sâh. It is to them that we must look for the strongest presentment of the type for comparison with whatever elsewhere may present true points of analogy.

Our next example is a green basalt statuette in the Museum of the Louvre, of which the lower part is broken off. It is a Pharaoh wearing the same head-dress as the last-mentioned, with the uræus, and the *shenti*, with a dagger thrust into the girdle, the hawk-headed hilt showing above. The face suggested to M. Deveria that it must represent one of the Hyksôs potentates. The character of the features is certainly the same, the nose sub-aquiline and broad, the same protruding mouth, and lips of

the same form, and the severe aspect, with brows knit into a frown. It is true that Prof. Maspero has expressed an opinion that this statuette may be of Saïte work; still I cannot but agree with Deveria and Pierret, and E. de Rougé also (I believe). The figure is, I think, not dissimilar to the fish offerers of Sâh, and the *shenti* is equally worn by Râ-ian or Khaïan, as the lower part of the figure with the throne found by M. Naville at Bubastis shows. M. Naville, however, agrees with Prof. Maspero.

There is yet one piece of sculpture which has been classed by Miss Edwards as a Hyksôs royal head. It is in that lady's possession, and was bought by the Rev. Greville Chester from the well-known collection of the late M. Peretié at Beirût.

I submit to your inspection excellent photographs, from a cast in three positions. The original is the entire head, only slightly injured in the nose. Miss Edwards has kindly given me the cast, and a memorandum in which she describes the sculpture as a "head of a Hyksôs king." "This head," she writes, "is in dark grey granite veined with diorite, evidently from the Sinaitic quarries, which were those worked by the Hyksôs rulers." When Miss Edwards adds, "This is the first head of Hyksôs type wearing the *Klaft* and *uræus* of royalty known to science," the statuette of the Louvre has (I think) been overlooked; but it is quite true that it is "the first that has been seen in this country." On careful study this young head presents features such as those which must have marked the early years of the Hyksôs king of Bubastis, and I think it may be a portrait of the same sovereign in his youth, that is, apparently, the second Apepi.¹

And now a word on the character of these countenances. They have a Mongolian aspect, as Prof. Flower has said, and Lenormant had pointed out their Turanian affinity. But although Mariette believed the latter Hyksôs monarchs to be of Khetan race, the sculpture shows a very marked difference, for the *noblesse* of the Kheta had, for the most part, a coarse face protruding in the middle features, but a retreating chin. In this the reliefs of Mer'ash agree well with Egyptian profiles of Hittites, and no one who has well studied the data will believe that the race is identical in these royal heads of Egypt. Nor does the beautifully-wrought relief of Marduk-idin-akhé in the British Museum agree. It is a different type again. The bronzes of Gudea show high cheek-bones and a grim countenance. Some Chaldean seal-cylinders exhibit figures with long and

¹ Professor Maspero found in 1883, at Damanhûr, in the western part of the Delta, some fragments of monuments similar to those attributed to the Hyksôs. ("Hist.," 4th ed., 167, note 5.)

thick hanging locks, and the twisted and twice recurved pigtails are a remarkable feature.

Huge twisted tresses, falling before and behind the shoulders, may be noticed in seal-cylinders from Babylonia adorning the heads of great priests, as, for instance, in M. Babelon's "History," p. 127, and a pigtail such as that of the captured King of the Kheta at Medinet Habû is to be seen on a priestly figure in a seal-cylinder of the first Chaldaean empire, engraved by Ménant ("La Bible et les cylindres Chaldéens," Paris, 1880, p. 32). The Babylonians of later times wore large curled tresses (Rawlinson, "A. M.," Vol. ii, p. 499). Lenormant pointed out ("Rev. Arch.," 1868, p. 231) a striking similarity to the Hyksôs heads in a very rude broken statuette of alabaster found by Sir A. H. Layard at Babylon. It appears extremely ancient; its beard and hair are arranged in the same fashion as those of the Hyksôs, with the remarkable difference that the long tresses part behind and come forward, leaving the back of the head with no hanging hair.

It is true that the Kheta wore their hair very long, and divided into huge tresses in front of each shoulder and down the back, but not, I think, educated into those huge curls and plaits, nor elaborated into artificial wigs. The enormous snaky curls or twists of hair which distinguish the representations of Isdubar or the so-called Nimrod-statues are another thing, or a marked variation.

It is a very curious thing that oblique eyes and a most placid Buddha-like countenance characterize the mask of Râ-skenen ta-âa-qen, the valiant Theban rival of Apepi, whose mummy bears such frightful marks of death in battle against those alien foes.

III.—We will now take into account the religion of the Hyksôs as far as our information may lead us, and here we encounter their god Sutekh, identified with the old Egyptian god Set. To this inquiry a great interest is added by the fact that this name equally denotes the god (or local gods) of the Kheta, and that the same object of worship was especially adored by the kings of the great XIXth Egyptian dynasty at the time of the Hebrew Exodus. When we say "the Egyptian god Set," however, it is right to remember that we cannot go back to the origin of the matter; that the strife of Set and Horus may have had some actual historic foundation in the rivalry and fusion of two powers symbolized by the red and the white crown of Lower and Upper Egypt respectively.

Whatever may be the truth of Apepi's attempt to force Sutekh-worship on the Egyptians, it is certain that the Hyksôs kings, whose memorials we possess, were ready to take Egyptian divine titles compounded with the name of Râ, the sungod of Heliopolis

(*On.*) This agrees well enough with the marriage of Joseph, prime minister of a Hyksôs king, with the daughter of Puti-p-râ, priest of On.

I fear to enter on the great Set-Sutekh question. It seems to me that Set, or Sut, is a fire-god, or a god of solar heat. One form of his name has a determinative of flame (Meyer, "Set-Typhon," p. 2), and his symbolic creature seems to be really a gryphon (eagle-headed lion). If, indeed, we look to "Turanian" quarters, Mr. R. Brown has some interesting remarks on Seth as the name of the Etruscan Hêphaistos, and similar Turanian words meaning "fire-place," "baker," &c. ("Pr. S. B. A.," 1888, p. 348).

We have at present sacred places of Neby Shit in Syria and Palestine, and Deir Seta in Northern Syria, near Edlib.


In the form Setekh, or Sutekh, we have Setekh-bek (equivalent in form and meaning to Ba'al-bek) in the North Syrian Karnak list No. 155; and Sikhi-satakh, in Assyrian annals, as a place (Prof. Sayce tells me) in the Kurdish mountains, east of Euphrates.

These places may help us to trace the name to its early haunts, and thus to trace the worshippers as well. The Gnostic Sethians in the second century made a wild confusion between the patriarch Seth and the heathen god ("Les Origines," &c., Vol. I, 219), and thus places of Set-worship became burying places of Seth.

The towns whose Sutekhs are invoked to guard the celebrated treaty between Râmeses II and Kheta-sar, form an interesting subject of study. I think I have made out most of them as belonging to the land of Kheta or Khatti, from Euphrates to the Taurus and the Phœnician coast-land, with Aleppo as about the centre of the group. Elsewhere (Bab. and Or. Record) I have something to say on these places.

An argument to prove the existence and "destruction of Hittite palaces on the borders of Egypt," in the time of the XIIth dynasty, has been drawn from supposed data in a stela at the Museum of the Louvre.

But on inquiry I find that the monument in question contains no reference to the Kheta.

Still the sons of Kheth were at Hebron as masters, with their intimate allies the Amorites, in Abraham's days, and the celebrated information as to the building (or rebuilding) of Zoan seven years later than Hebron (Numbers xiii, 22), certainly seems, equally with the common devotion to Sutekh, to connect the Kheta with the Hyksôs domination in Lower Egypt. Set was fully identified in Egypt with Ba'al () and it is

interesting to find that the Phœnician Ba'al-worship was taught by Jezebel to Ahab "according to all (things) as did the

Amorites" (1 Kings xxi, 26). Those who have studied the Egyptian data well know how thoroughly the Kheta were locked in and dovetailed, as it were, with the Amorites in the north and south alike, just as we find them in the Bible; and it seems in a high degree improbable that both these strong races together were not deeply involved in the Hyksôs invasion and lordship of Lower Egypt. They were fortress builders and chariot soldiers, and the nomad hordes of Shasu were their auxiliaries.

We will now turn to the broken materials of history of these obscure times.

Mariette has shown in his Catalogue of Abydos that the XIVth dynasty was not synchronous with the XIIIth, but succeeded it. Kings of the XIVth dynasty were brought to Abydos to be buried (p. 236). It was after the XIVth dynasty that the conquest took place. At Abydos there is a great blank from the XIVth to the XVIIIth dynasty.

The actual history of the Hyksôs period is very obscure. A most interesting inscription of Hatasu in the Speos Artemidos (Stabl Antar) at Beni-Hassan recites that the great queen had restored from ruin temples and altars:—"I re-established what was in ruin, and completed what was unfinished, for there had been Aamu in the midst of Lower Egypt and Ha-uar, and the foreign hordes among them had destroyed the (ancient) works. They ruled, not acknowledging the god Râ [ignorant le dieu Râ]. (Golenischeff, "Rec. du Trav.," Vol. iii, p. 2. The text is given in Vol. vi, p. 20.) M. Golenischeff notices the accordance of this text with the papyrus Sallier I, where the invaders are said to have been settled in "the town of the Aamu;" and he supposes that the name Hyk-sôs (*haq Shasu*) was invented by Manetho as descriptive of these rulers.

It is to be believed that the basis of the celebrated tale of this papyrus with regard to the religious dispute of Apepi and Râskenen is true enough; that some provocation on the part of the Shepherd-king, who built the temple of Sutekh at Zoan, may well have brought on that great struggle in which the Theban King, the third Râ-skenen, called Tau-âa-ken, fell on the field.

This must have been the terrible end of the valiant king whose mummy was found at Deir el-Bahari. But Chabas and Maspero have shown that it was the first of the three Râ-skenens to whom Apepi's embassy was sent. Some relics at the Louvre show that he had assumed Pharaonic titles, and it was he who founded the XVIIth Theban dynasty during which the war of expulsion went on ("Hist.," p. 169, "Pap.," 'Abbott, p. 72, &c.) The opening of Râ-skenen's mummy is described by Professor Maspero in "Recueil," &c., Vol. viii, p. 179, &c.

For the last campaign we happily have the inscription of Aahmes, the admiral, whose father had been an officer of the slain Râ-skenen, and who fought under Aahmes, the Pharaoh, at the siege of Haur, and in the long pursuit, and at the siege of Sharuhén, doubtless the ruined place, Tell esh Sheri'ah, north-west of Beersheba; and afterwards served under Amenhotep I and Thothmes I, the son and grandson of Aahmes, in the great wars of retributory conquest in the land of Naharina of the Rutennu, as far at least as the Euphrates, where Thothmes set up his monument of sovereignty at the north-eastern boundary of his empire, namely, at the important fortified town of Nii, the position of which has not yet, I believe, been fully determined. Babelon marks it on his map on the east of Euphrates above Birejik; but this cannot be. Lenormant had put it on the west side, higher than Pethor. ("Hist.," 9th ed., Vol. ii, p. 234.)

In the short reign of the second Thothmes, the Shasu dared to attack Lower Egypt, but must have been thoroughly beaten off, for in Hatasu's time all went well, and tribute came in freely. But no sooner was this splendid queen's younger brother, Thothmes III, left alone on the throne than a general rising broke out from the borders of Egypt to the northern frontier, and a muster in great force took place at Megiddo, which led to the wars of this most distinguished of all the Pharaohs. A monument of high interest for his time is the inscription of Amen-em-heb, another hero of the mettle of Admiral Aahmes, who closely attended the person of the King in the Negeb, and on to Naharina, fighting near Aleppo, at Karkemish, and in the land of Sentsar, and again at Kadesh on Orontes; and another time at Nii, where the king killed 120 elephants for their ivory. Afterwards he attended Amenhotep II in his victorious campaigns (Chabas, "Mélanges," III Série, tome ii). We find the prisoners taken in Naharina called by the familiar name of 'Amu, which reminds me that Balaam is described as dwelling by the river (Euphrates) in the land of the Benê-'Amu. He was a lord of the 'Amu, the Semites, in close contact with the Khatti or Kheta. It is a striking illustration of the collocation of separate races that the Egyptian tableaux represent two highly contrasted types under the name Ruten, or Luten, the one thoroughly Semitic, the other quite resembling the Kheta. This may be well seen in Mr. Petrie's casts.



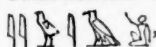



It is also to be noticed as a sign of the times that the *noblesse* of Kadesh and Tunip (Tennib, near Ezzaz), and others taken in these wars, are called by the Aramaic title, *Marina* (Maran), which shows that the Semitic element still prevailed in these regions.


The name of the land, Sentsar, is highly interesting. It is


taken by Chabas as a variant of Sangar, a name also used in the time of Thothmes III, as Sentsar was again by Amenhotep III.

Chabas takes it as the Shin'ar (שִׁנְאָר) of the Bible, and this would be the Sumar of the cuneiform inscriptions. It is, however, not certain that these are variants of one name, and we must take into account the River Sangar (Sajûr), and the Singar hills—country east of Euphrates. But the tribute of the Kings of Sangar, including "blue-stone of Babel," *i.e.*, lapis lazuli, must have come from Shin'ar.

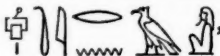
Amenhotep II made war in the Euphrates region, and we find him at Nii in the north ("Zeitschr," 1879, p. 55, &c.), as well as far south opposite to the Palmyra country. His successor, Thothmes IV, made war against the Kheta, from whom Thothmes III had received tribute, and had a valiant staff officer with him, a successor of Aahmes and Amen-em-heb, called Amenhotep, who fought by his side from Naharina to Galla-land in Africa (Brugsch, "Hist." Eng. tr. I, p. 413).

The same far-reaching empire owned the sway of the next Pharaoh, the celebrated Amenhotep III, whose dealings with Naharina were still more important; for, although his wars were mostly in Kush, it was in the riverland of Naharina that he hunted and slew 210 lions, and won his beloved queen, Taia, the daughter of Iuâ and his wife Tuâ. Naharina was his favourite region, and we shall soon know much more about it from the invaluable discovery of some three or four hundred cuneiform tablets, which had been taken from Thebes by his son Amenhotep IV (the notorious Khu-en-Aten), and were found among the ruins of his short-lived capital at Tel el-Amarna the other day. Among these are despatches of a surprising kind from North Syria and Mesopotamia as well as from Palestine, some of them from the father of Queen Taia to his son-in-law the Pharaoh. This potentate of Naharina turns out to have been Dušratta, King of Mitanni, although in Egypt he was called Iuâa. Possibly we may account for this. In the inscription of Hatasu before quoted it is said "the peoples of the Resha and the Iû hide themselves no more before my majesty!" (the names are , ). This indicates confidential relations, and it seems to me possible that Iuâ, , may be a native name of the , Iu people and the prince's proper name, while Dušratta may be a title of honour. Cf.  [Iu the great?] *foreigner*, father of , Râmeses em per-Râ ("prime minister

of the King" in the first year of Mer-en-Ptah), whose native name was  Ben Mat'ana (בן מתן) of the land of T'arbasuna (צרבסן). (Mariette, "Abydos," p. 421).

I would also compare the name  with Bent-Resh, the possessed princess of the land of Bakhtan, which I take to be Bukhtan, with a river of the same name, on the east of the Tigris; for it is not unlikely that this region offered tribute to the great queen of the XVIIIth dynasty.

Iuâa was not the only prince of Naharin whose daughter was wedded to Amenhotep III, for a princess of the odd name Kirkip was given to the Pharaoh by her father Satharna, Prince of Naharina.

[I now (July, 1889) see the name of Šutarna as the writer of one of the cuneiform tablets of Tel el-Amarna mentioned by Dr. Winckler ("Zeitsch. f. Aeg. Spr.," 1889, p. 59), and this I take to be probably the identical King Satharna,  Prince of Naharina.]

The name of Kirkip perhaps lingers as a local name at Djirdjib, west of the Khabûr river (see "Sachau," p. 226).

For the story of this princess see Brugsch, "Zeit.," 1880, p. 82. It well illustrates the relations now so fully disclosed by the cuneiform tablets, which show that Amenhotep III and IV were in close and friendly relations as suzerains with the Babylonian Kings, Kurigalzu and Burnaburyash, father and son, about the middle of the 15th century, B.C.

My object in reciting these affairs of two centuries after the expulsion of the Hyksôs, is to show who were the races and rulers whom the Pharaohs of the XVIIIth dynasty, heirs and successors of Aahmes, sought out by strenuous warfare and conquered into willing submission; for they must have found in Palestine and Syria, and on the Euphrates and Tigris, the powers and races whom they had driven out of Egypt. The powers indeed were expelled, but doubtless the common folk remained, and it has been well shown by Mariette and others that the stern and sinewy people of the great meres and surrounding deserts of the Delta are of the same race, to judge by their likeness in face and figure to the sculptures of Sâa (Mariette, "Mélanges d'Arch.," Vol. i, p. 92); and Miss Edwards has well cited Heliodorus and Achilles Tatius (A.D. 400-500), who "describe the bucolic population (Bashmurites) of this district as a fierce and lawless race of great size and strength, who went bareheaded, and wore their hair in long locks to their shoulders, these

Bashmurites being the descendants of the Hyksôs of ancient times" ("Harper's Magazine," Oct., 1886, p. 722). Well might their forefathers have been "an abomination to the Egyptians." Now it is hard to doubt that the most migratory, predacious, and enterprising races that lay between the Nile and the Tigris (perhaps still further afield), being driven out by the shock of such conquests as that of Kudur-nan-khundi, the Elamite predecessor of Kudur-lagamar, should "go down into Egypt" with wives and children, horses and cattle, as the Libyan hordes endeavoured to do in the days of Merenptah, and as the Arabs did so long afterwards. This view of the Hyksôs invasion as due to the movements of the Elamites from the east on Babylonia is excellently expressed by Prof. Maspero ("Hist.," 4th ed., p. 161). If these invaders of Egypt had fled from the power represented in the book of Genesis by Kedorla'omer (Kudur-lagamar), then the welcome given to Abraham by the Hyksôs, as by the sons of Kheth and the Amorites, would be very natural, for probably the head and front of these races would be found in Egypt, and the later Pharaohs of this *régime* would know how to estimate Joseph.

The coincidence which Brugsch has pointed out in the inscription of Baba, at el-Kab, which records his philanthropic provisions during the long famine, should not be overlooked, when we consider that he was apparently the father of the Admiral Aahmes who bore so distinguished a part in the war of liberation. Baba's exertions may have been part of the general administrative work of Joseph.

The large alien population that remained settled in the Delta must account, as Stern has said ("Deutsche Revue," Oct., 1882), for the almost entire absence of monuments yet discovered, in that part of Egypt, of the great XVIIIth dynasty.

In the spring of this year M. Naville found at Bubastis two broken statues of scribes of the time of Amenhotep III, and a fragment containing the name of Aten-Râ, the special object of worship of Amenhotep IV, Khuenaten.

It is earnestly to be hoped that tombs of the Hyksôs may yet be found. Then we may have historic information in a coherent form, instead of the shreds and patches that have hitherto reached us.

In conclusion I would notice a few chief points which strike me in the present condition of our knowledge:—

1. I do not think that the Hyksôs could have been of the same race as the people of Pûn (South-west Arabia and Somâli-land), for neither the sculptured faces, nor the cast of features and figure of the present occupants of the eastern part of the Delta in the mere-lands, resemble the highly-defined type

of the Pânites, with whom the Egyptians of the XVIIIth dynasty were on such friendly and polite terms. I think, indeed, that Queen Hatasu had a *corps d'élite* of Pânite body-guards in her own service (see Meyer, "Hist.," p. 217, woodcut). I do not say, however, that the Canaanites of Palestine found no place among the Hyksôs. Doubtless they did, and such useful people as that Syrian of Gebal, whose receipt for eye-salve is given to us in the papyrus Ebers (Wiedemann, "Gesch.," p. 278), would be very welcome in Egypt.

2. The type of the sculpture of which we have been speaking is so clearly marked off that I can scarcely call to mind anything else to compare closely with it.

The colossal head lately found at Bubastis (now in the British Museum) has the very same cast of features and expression, heightened in all finer attributes, and softened by Egyptian culture, and I think this must practically settle the question of the Hyksôs origin of the older sphinxes and statues. They cannot now well be attributed to some local school of art older than the Shepherd Kings, as, for instance, Meyer has ascribed them to the Herakleopolitan IXth and Xth dynasties ("Gesch.," p. 143, &c.); and I think the Semitic symbolism of "government laid upon the shoulder" agrees with the inscription of Hyksôs titles on the right shoulder or arm, instead of the breast, as Mr. Petrie has observed ("Tanis," p. 12). He connects it with the offering of the right shoulder in sacrifice as typical of consecrated power. The physiognomic type, however, is not Semitic nor Kushite, nor Libyan, nor (I think) Khetan. It is, as Professor Flower said, of Mongolian affinity, or the like. We can shut out a great many races, but we hardly yet know which to admit, so little do we know what Akkadians, Sumerians, Cossæans, and others were really like.

There is, however, something of the Gudea statuettes in these heads, but they are very unlike the short rounded faces of the sculpture of Telleh.

That we should have before us so distinct and so highly interesting a type is most encouraging to further research.

Since this paper was written I have seen the observations of Prof Virchow on the Pharaonic mummies and sculpture, in the "Sitzungsberichte" of the Berlin Academy, 1888. With regard to the Hyksôs sculpture he gives linear sketches and measurements, including the colossal head found at Bubastis, and remarks:—"The alien character (*Fremdartigkeit*) of these features is observable at first sight, but their ethnographic position (*Fixirung*) presents the greatest difficulty. . . . Perhaps the originals were Turanians. But I know not how to say

what (*Turanians*). Of Akkadians no trace has yet been discovered in Egypt."

It will be noticed that the learned physiologist speaks with greater doubt than Prof. Flower. The problem is, however, at best very hard of solution. Still we have here only the greater incitement to perseverance. Some monument, some scrap of papyrus, some unnoticed trifle in a museum, in private hands, or lying among the potsherds, may give us the clue we require.

A reasonable and staunch spirit of inquiry does not often fail in the end. The great discoveries, within so few years, of the royal mummies of Deir el-Baheri, the store city of Pithom, the military post at Takhpankhes, the Greek colonial town of Naukratis, and the unexpected historic monuments of Bubastis; and (almost more surprising) the cuneiform tablets of Tel el-Amarna, are good warrant for the hope that, as the philosophic and devout Kepler said, "God will be so good as to let us know some day the things that we so earnestly desire to have unveiled to us."

DISCUSSION.

Mr. F. GALTON having been assured by Mr. Tomkins that there were no grounds, philological or other, for supposing that the pastoral possessions of the Hyksôs races had been limited to sheep, thought it a great mistake of Egyptologists to describe them by the epithet of "shepherds." It gave a misleading and petty idea of the original social condition of those races. Tribes who possess horned cattle are tempted to become marauders on one another on a large scale, for oxen are valuable beasts, and they can be driven in herds at a gallop, and being much less dependent on water than sheep, they can be driven far. Hence cattle-owning tribes have usually been daring "cattle-lifters," bold horsemen, and predatory warriors. Shepherds, by the force of circumstances, have milder habits. Had the Zulus possessed nothing but sheep, it is very unlikely that they would have developed the warlike aptitudes by which they are now distinguished. The word "herdsmen" might be used with perfect propriety to replace "shepherds" in connection with the Hyksôs. It is correct in its literal meaning as well as in the associated ideas that it suggests.

Mr. F. G. HILTON PRICE understood Mr. Tomkins to say that Amenhotep III slew 210 lions. Being familiar with the large scarabæi of that monarch, he begged to differ from him in that assertion, and should like to state that during a period of ten years, that is to say, from the first year of his reign up to the tenth year, he slew 102 fierce lions.

Rev. Dr. KINNS said that as Mr. Tomkins only mentioned the arrival in England of the colossal statue sent over by M. Naville,

it might interest the Institute to know that the broken portions are now put together and placed in the Egyptian Gallery of the British Museum. The shoulders and left arm not having arrived with the other fragments, the head cannot at present be fixed, but some plan will probably be devised either to restore the shoulders, or a further search will be made for them at Bubastis, so that the figure may be completed, of which the portions at present in our possession weigh between 13 and 14 tons. After a most careful search Apepi's name has not yet been found upon the statue, but it might have been upon the missing arm, where the Hyksôs kings generally placed their cartouche.

Mr. G. BERTIN said that there is now no doubt that there once existed in Syria a Turanian speaking population, but if the names in Syria are Turanian, it proves only that such a language was formerly spoken, but does not prove that it was still used when these names were employed, as in France the name of rivers are Keltic, though Keltic has been dead for nearly 2,000 years. In like manner the Greek name George does not prove that the Georges ruled a Greek population, nor can we conclude that the French are Teutons because they were ruled by kings called Henri, Louis, Charles, &c. Chabas and De Rougé had arrived at the conclusion that the shepherds who invaded Egypt were a Semitic speaking population, and in spite of the new "Hittite" monuments the conclusion still held good. Mr. Bertin did not believe that the invaders of Egypt came from the east through Babylonia, for at that period the Semitic speaking populations of that region were too strongly constituted; if these invaders did not come from Syria itself they must have come from Asia Minor. As to the elephant, whose presence in Syria was a surprise to Egyptologists, it is well known to Assyriologists that in ancient time they were abundant in all Western Asia. Even as late as the Assyrian Empire the elephants were hunted by the kings. These elephants were of the same species as the Indian, not the African elephant.

Mr. ST. CHAD BOSCAWEN also joined in the discussion, and the Author replied.

The following Paper was taken as read—

*The RIGHT of PROPERTY in TREES on the LAND of another, as an
ANCIENT INSTITUTION.*

By HYDE CLARKE, V.P.A.I., V.P.R. Hist. Soc.

FROM 1860 to 1867 I was Vice-President of the Imperial Land Commission in Asia Minor, and then I became acquainted with the fact of there being separate property in trees, on the value of which we were called upon to adjudicate.

This property was of two kinds, one was individual property in trees in communal or government woods. These trees were what were called honey trees, being trees in which the wild bees made honey.

The other kind of individual property was that described by Dr. Codrington (*Journ. Anth. Inst.*, xviii, p. 311), namely, trees situated on the land of another man, who was the owner of the land. These were chiefly olive trees.

Thus in a field there might be seven olive trees, say three belonging to a widow and two each to daughters, in no way related to the owner of the field. There was separate compensation to the latter, and to each tree owner.

These tenures were mentioned by me before the Domesday Congress in 1886, and are referred to in the proceedings. They had greatly excited my interest, and until the testimony of Dr. Codrington they seemed to me to be anomalous, so commonly accepted is it that property begins in land. It will probably be found that there are many examples of tenures in trees besides those herein given by me.

The honey trees appear to me to give the clue to the origin of the practice. Here we have paid little attention to honey since the introduction of sugar, but it held a more important place in earlier times, as shown in the Domesday record. We may do best to turn to North America. It is difficult to find a honey tree in the tangle of the forest, and the American bee-hunter has to apply ingenuity in catching a bee, and making a bee-line to the desired object. As the bee flies straight, another bee is caught so as to make an angle with the other line, and thus determine for the hunter the site of the tree in the tangle of the forest. His purpose is only to rifle the store for the season.

The bees in Asia Minor frequent the same tree year after year, generally a hollow tree, and the villager who can find such a tree in the forests, which are sometimes the divisions between the townships (as in Domesday) renders a great service to the community. It is well therefore that he should enjoy a prior right.

In such form—and looking to the value of honey trees elsewhere, and the property in them—it appears to me that a right of individual property may have been so first acquired, and this has been a reason with me for instituting this enquiry on account of its value in the history of jurisprudence. Although our writers, influenced by Western notions, look upon land as peculiarly suited to be treated as property, practice does not confirm this. Land in the rude communities is of very little value. Pasture does not confer value, for pasturage does not always cover the same lands. In many countries there is summer

pasturage and winter pasturage. What is, too, of great importance is the right of way, and in this respect the passage of large herds of cattle, and, till lately, of the vast flocks of merinos in Spain, and of flocks and herds in Asia Minor. Pasturage is inimical to husbandry.

It is not surprising to find in communities that, when cultivation has been introduced, individual ownership does not necessarily follow, but the cultivable land is each year distributed among members of the community or township, sometimes by lot.

Property in trees may thus be conceived to precede property in land, which of itself would be later than the pastoral state. The man who discovered a honey tree or date palm, or made an olive tree bear, would acquire a specific privilege. When once such a tree yields products it continues year after year, but a field must be yearly cultivated, and it matters little to the cultivator what field he uses for the season, for he looks to the crop. Hence the trees may have given ownership in the land, rather than the land given ownership in the trees. In later times in most systems of laws, trees on land become appendages of the land, particularly in Europe. In Asia Minor, in this day, land varies greatly in value. Generally speaking, corn land is unfenced, the grain is sown broadcast, and such a field is not considered, as here, to be the choicest property. Unsown land in Asia Minor was polled by the Commissioners at from 5s. to £1 per acre, as in Australia or Canada; tilled land at £5, while ground cleared for cotters or planted as a fig orchard or vineyard, and fenced, would be valued £20 an acre, or more. So, too, fig orchards or vineyards have a special and high value as compared with corn ground.

My knowledge with regard to Asia Minor remained a solitary fact with me for a quarter of a century, although, as will be shown in this paper, there are many examples. My only idea was that this institution might have been derived from China, as many of the institutions of the Turkish Empire conform to those of China. That it must be an ancient institution was never a matter of doubt in my mind. The ancient origin of our modern laws has always appeared to me a fact in anthropology, and one well deserving of investigation. The legends of lawgivers and the history of the Laws of the Twelve Tables have always appeared to me to relate to the transmission and continuity of law, the principles and practices being, in many instances, preserved to this day, although many old laws have perished under the influence of social and political changes.

In that great practical school of comparative history, in which so many years were spent by me in Asia Minor, there was much

to be contemplated in respect to law as well as other institutions. Under my eyes were the pastoral or nomad tribes encamped in their black tents, having driven their flocks and herds from most distant regions. They had come in contact with the cultivator, entering on any ground which had been cropped, and even breaking fences. Then the cultivators, as many have observed, used the implements which are described by Homer and Hesiod.

Thus each epoch was depicted in life even to the railway which crossed the country and to the telegraph wires which spanned it. So it was in law: the most ancient institutions were found in being, as the scriptural rights and wrongs of herdsmen and husbandmen already described. What we regard as the Germanic institution of frankpledge was in full force and in useful application, but assuredly not derived from the Germanic codes. For him who cared for it there were to be found, in full exercise in their respective communities, the Mosaic Code, the Institutes of Justinian, and even English and American law. There are few, however, who have the knowledge or the desire to profit by opportunities offered by the living instances of so many varied ancient and modern institutions, preserved among populations of many races and many languages.

With regard to my own particular problem of the trees, the first stage in its solution came from a most remote region, and was a direct result of those researches in comparative science which it is the function of the Anthropological Institute to promote. It was through a paper read by the Rev. R. H. Codrington, D.D., on Social Regulations in Melanesia, in May of this year 1889,¹ and published in our Volume XVIII, p. 311. As this paper of Dr. Codrington's is for our purpose brought under a new aspect, it is desirable to re-print textually the page of his memoir relating to property in trees. It explains the subject well, and it would be inconvenient for the student or reader to turn back to the volume if it were accessible to him.

"Land is not held in common; every one knows what belongs to himself. Yet the individual has the possession only of what he has inherited, and uses for his lifetime as part of the whole property which belongs to the family. There are not two or more divisions of the land thus held in property corresponding to the marriage divisions of the people; the land of these divisions is intermixed. Probably in the origin of each settlement the members of each marriage division worked together; as it is, families have formed themselves within the marriage

¹ This paper was also read at the British Association at Bath in 1888, and will be found in the Report, p. 843.

divisions, and the land is in possession of families. The chiefs have nowhere more property in the land or more right over it than any other men; though, naturally, they are willing to assert such claims in selling to Europeans, and often use their power to drive away the owners of gardens they desire to occupy. Before the coming of Europeans, the sale of land was not unknown, though certainly not common: of late especially in the New Hebrides, much land has been nominally bought from chiefs or supposed chiefs, but no true sale. There is no remarkable example of the fixedness of native right of property in land to be seen at Saa in the Solomon Islands, at the southernmost part of Malanta. The much greater and much more important number of the inhabitants are descendants of refugees, who came, eleven generations ago, from inland, and were received by the then owners of the place, who allowed them the use of land for houses and gardens. To the present day, with the exception of some parcels they have bought, or which have been given to them, these immigrants, even powerful chiefs, have no land of their own; it is perfectly understood that the land they occupy belongs to the original inhabitants. But, in fact, everywhere, or almost everywhere, the abundance of land makes it of little value.

"If an individual reclaims for himself a piece of bush land, it becomes his own; and the different character of his property in it is shown by the difference in the right of succession to it. If, as sometimes happens, a village grows up in the garden ground of an individual, or of a family, the property in the house sites is recognized as not being altogether that of the occupiers. They pay no rent, but they show a certain respect and consideration for the representative of the proprietor.

"It is remarkable that fruit trees planted, with the consent or acquiescence of the owner, upon another man's land, remain the property of the planter and of his heirs. In a true sale, the minute and accurate knowledge of property in land and trees is remarkably displayed. I once completed the purchase of a site for a mission school in the Banks' Island, and found the rights and the limits, and value of the rights, of every man and woman concerned surprisingly acknowledged and defined by common consent. When I thought all was finished, a fresh applicant for payment on account of a fruit tree appeared from a distance, accompanied by the owner of the land on which the tree grew, who testified that the claim was good. 'Certainly,' he said, 'the claimant's grandfather had planted that tree, and he had the right to it.'"

It will be seen that the state of affairs described by Dr. Codrington exactly fits that observed by myself. It was

evidently not a mere coincidence, and its great distance in space from Asia Minor to Melanesia was an anthropological measure, such as has been pointed out by me, corresponding to a great period in antiquity. It gave a strong reason for prosecuting enquiries to discover other examples of what was undoubtedly an ancient institution widely distributed.

The fact of the instance occurring among savages in Melanesia, so far from affording a plea for neglecting its relevance, was with me a reason for studying it and paying due attention to it. What McLennan discovered in Australia and Polynesia, and which has thrown a new light on the prehistoric period of the East and West, what Bleek discovered of the relations of Australia show the value of illustrations from remote regions where survivals of the prehistoric period can best be preserved. There was too another special inducement in this case to enlist my attention. A paper in the XIV Volume of the *Journal of our Anthropological Institute*, p. 142, had made a strong impression upon me. It was by Mr. A. W. Howitt and Mr. Lorimer Fison, M.A., "On the Deme and the Horde," and institutions of Attica, which had been a matter of controversy with classical scholars, were explained from the existing practices of Australian blacks.

Having been present at the reading of that paper, and having taken part in the discussion (p. 168), my reasons for placing a direct value on the evidence of savages will there be found. The savage of this day is no more the originator of the institutions he preserves than is the Slav or Albanian immigrant, now resident in Attica, the author of Hellenic institutions, neither are Hellenic institutions necessarily Aryan. The true solution is the spread of culture by the white Turanians, from whom both Aryans and Australians have derived what we now have in evidence. Upon this doctrine of anthropology the present course of investigation throws light. The paper of Mr. Howitt and Mr. Fison appeared to me to have a direct relation with the matter marked by me in the paper of Dr. Codrington. What struck me was that in Asia Minor the olive is one of the special trees of property, and it may be that the olive has a particular relevance to the tradition of the doctrine. The olive has a well-known place in the legends of Attica, and likewise in the symbols. The olive is found on the autonomous coins as the chief representative of a tree, as recorded by me in my paper on the early Mediterranean Populations, in the *Transactions of the Royal Historical Society*. The value of the olive for its fruit and its oil conferred a particular benefit on the populations of all those southern countries.

Finding that Sir Henry Maine had not dealt with the institution of property in trees on another man's land, a series of enquiries

was made by me among leading jurisconsults, students of institutions, travellers, and others to obtain information. Very much labour was undertaken by my friends, sometimes resulting in obtaining merely negative information, but contributing to the building up of the subject. Among those to whom thanks are due are Professor Sir Frederick Pollock, Bart., Professor F. W. Maitland, Mr. C. H. C. Carmichael, M.A.I., Mr. Frederick Seeborn, M.A.I., Sir Thomas Wade (late H.M. Minister in China), the Chinese Legation, Sir Spencer St. John, M.A.I. (H.M. Minister in Mexico, formerly in Sarawak), Mr. Alfred R. Wallace, F.R.S., M.A.I., Sir Richard Temple, Bart., M.P., M.A.I. (formerly Lieut. Governor of Bengal), General Sir C. P. Beauchamp Walker, M.A.I., Mr. M. J. Walhouse, M.A.I., Mr. Rudler, M.A.I., Mr. J. F. Hewitt, I.C.S., Mr. Francis A. Munton (late Pres. Law Institute), Mr. P. Edward Dove (Sec. Selden Society), Mr. R. Biddulph Martin, M.A.I., Mr. W. M. Crocker (North Borneo Company), Mr. H. H. Howorth, M.P., M.A.I.

Mr. William M. Crocker, of the British North Borneo Company, informs me as follows, and this has been confirmed by others. This may be considered as an intermediate extension of the Melanesian area:—

“The most striking instance I know of in Borneo with regard to the right of property in jungle trees is connected with the Katapang tree.

“This tree grows to a great height. It has a long, straight, clean trunk, and throws out its branches near the top, resembling an open umbrella. Being much frequented by bees, a considerable revenue is derived from the wax obtained by the natives from the nests; and, as a consequence, their rights are so jealously guarded that lawsuits in connection therewith are not uncommon.

“When the Chinese were coming into Sarawak in large numbers, and taking up land for gambier and pepper planting, many Dyaks came to complain of the destruction of property which had been in their families for generations.

“The Government offered to forbid the Chinese to cut the trees down, but when the native owners asked that the jungle for 200 fathoms all round each Katapang tree should also be allowed to stand, without which the bees would desert the neighbourhood, the Katapang trees and old customs had to fall before the enterprising Chinese, who willingly paid a few dollars as compensation.”

Mr. Crocker likewise called my attention to the existence in Borneo of another special property in the case of caves containing edible birds' nests, of so much value for sale to the Chinese as a commodity.

Mr. Crocker says that the bees build in the clean branches and trunk of the trees. He has seen between twenty and thirty bees' nests in one tree.

Sir Spencer St. John observes that in Borneo, speaking of his own knowledge of Sarawak and his travels in the island, the land nominally belongs to the state or the tribe, but it is not a private property in land in our sense of the word. He, too, had observed that certain of the Tapang, on which the bees construct their nests, often belong to special families, and would not be touched by their neighbours.

Sir Thomas Wade kindly made much personal research in Chinese law books, besides consulting the Legation.

He wrote me lately that so far he had not learned much in the matter of separate proprietary rights in land and trees, and inclosed translation of a memorandum that he had received on the subject from the Legation. In the laws he had not as yet found anything to help, but was examining the case books.

Sir T. Wade's Memorandum is as follows:—

"Where hill farms or gardens are leased the tenant will pay the proprietor a yearly rent. All fir trees or bamboos on the ground (before it is let) belong to the proprietors, and the tenant is not free to appropriate them. If there were no such trees upon the ground, as above described, when it was let, and such trees were subsequently planted by the tenant, all such trees would be at the disposal of the tenant."

The only bearing this has is a recognition that the tenant can have a property in the trees apart from the landholder. China is so vast, and the conditions of its districts are so various, that further and more definite information may be hoped for. The occupation of the tenant and separate right appears to be derived from the ancient and original practice.

The next region in which the separate property can be traced is in India. There it must be found in many places, but as yet the only district known to me is Chota Nagpore. This was communicated by a well-known observer of Kolarian and Dravidian institutions—on which he has written some valuable papers for the Royal Asiatic Society—Mr. J. F. Hewitt. He says he knows that it is frequently found that fruit trees growing on land are owned by persons other than the owners or cultivators of the soil. The mhowa trees, which are exceedingly valuable, are frequently divided among the inhabitants of the villages near which they grow. This is certainly the case common in Chota Nagpore.

For the account of the tree, the Director of Kew referred me to a paper on the Mhowa or Mahwah, an Indian food tree, by Mr. C. G. Warnford Lock, in the Journal of the Society of Arts,

Feb. 25, 1881, p. 285. The name is spelt by Europeans in at least a dozen different ways, and is applied to *Bassia latifolia* and also to *B. longifolia* and *B. butyracea* whose fruits are also edible. The singularity of the genus is said to consist in the fact that, besides affording eatable fruits, their fleshy deciduous corollas are largely employed for the same purpose. They constitute a staple and sometimes almost the only article of diet available to the poorer classes of Indian natives during several months of each year. The tree is abundant in Central India and is cultivated in many other districts.

The produce is collected chiefly by the women and children. At night bears, deer, and other animals visit the trees to take their share of the crop, and in the morning and late evening jungle fowl and pea fowl. Cattle are very fond of the flowers, and in the season cow's milk has a strong scent of mhowa.

Mr. Lock says that it is very difficult to obtain any trustworthy statements as to the yield of the trees, nor does he say anything as to separate ownership. He does, however, state that the trees are rented (evidently separately), and that their rent varies according to the yield of rice and other produce. Mr. V. Ball, late of the Geological Survey, may have given more information, for he recorded a great range in prices.

We are informed that according to some authorities two mounds of mhowa will furnish a month's food to two parents and three children. It is eaten both fresh and dried and mixed with other food articles.

It is largely distilled for a highly intoxicating spirit called *clara*. As much as six gallons of proof spirit have been obtained from one cwt. of the flowers. An oil is also extracted which is used for cooking purposes, for mixture with ghee, for lighting, and for soap-making. The dried leaves will keep for any length of time.

Sir Richard Temple is of opinion that relics of tree property are likely to be discovered in Ceylon as a forest country.

Coming back to the nearer East, and thereby to Europe, we have this individual right in trees existing as an ancient and a modern practice.

So far from this practice being confined in Turkey to Asia Minor, individual property in trees prevails as a general law in the Ottoman Empire. Miss Pauline Irby, who has written much on the Balkan countries, found it in Bosnia, as described by her in the "Contemporary Review" for July, 1889, p. 34.

An estate of about forty acres had been left by a Turk to his two sons in two parts. To the one son he had assigned what was called the "garden," which consisted of an orchard of plum trees, and, besides this compact piece, included all the fruit trees,

apples, pears, and plums, straggling hither and thither about the fields, which were assigned to the other son as a separate possession.

The separate tree property Miss Irby bought.

These plum trees acquire a special value as being largely employed in distillation of a strong spirit in Bosnia, Servia, Bulgaria, and in neighbouring countries which have not been under the administration of law which may be considered to be peculiar or Turkish.

How far the practice is a survival locally must be matter of future examination. It is true it is found in a district of ancient Turanian culture, but the intermediate stages of transmission are wanting.

Professor Maitland has pointed out to me a passage in the Institutes, 2, I, 31, 32, but other enquiries have prevented me from examining it. The general tendency of legislation and procedure during the Roman Empire was to concentrate the rights of ownership, and to exclude the claims of tenants.

At the same time we may find it worth while to reconsider the relations of forest rights under the aspect of our present researches. There is generally in most regions a communal or individual right to take from forests fuel, and in some cases timber. In India and in Turkey where the State is organising forest administrations and forest laws, such rights are recognised and provided for.

That the practice under consideration did anciently exist in these islands was ascertained for me by Mr. Frederick Seeböhm. He found traces in the Brehon laws of Ireland. This connexion would have given great satisfaction to Sir Henry S. Maine,¹ for he felt a special interest in the Brehon laws, the authenticity of which he vindicated as handing down ancient materials. He also dwelt largely on the doctrine of discovery, an element of proprietary rights and title which is the real basis of the theme brought before the Institute by me. In fact, this all goes to confirm the practice of Sir Henry Maine in seeking the origins of later institutions in the survivals to be found preserved among rude tribes and in rude conditions of society.

So far as my search has gone, however, there is nothing on the immediate subject in Sir H. Maine's "Ancient Law," his lectures on the "Early History of Institutions," or "The Village Communities of the East and West."

Mr. Seeböhm indicated to me the passages in these obscure Brehon records.

¹ Sir Henry was often invited to take part in the Council of the Anthropological Institute, with the studies of which Society his own were so closely allied.

"Ancient Laws of Ireland," iv, p. 169.

Bee Judgments.

The bottom is entitled to the fruit of the top every fourth year—of the land in which the fruit is sown.

Commentary.—"The distribution of the swarms, *i.e.*, the swarms to be divided by them, *i.e.*, in the 4th year. 'For the bottom is entitled,' *i.e.*, for the owner of the bottom of the tree becomes entitled to the fruit of the of its top every fourth year, *i.e.*, it is to the owner of the land in which (the tree) is planted.

"In the other three years it is divided into two parts between the land in which it is planted, and the land out of which it grows."

This allusion is made, says Mr. Seebohm, to get a rule for the rights as to a swarm of bees in the top of a tree.

Again in the *Senchus Mor* is another passage.

"Ancient Laws of Ireland," i, 203-207.

"Senchus Mor.

"The appropriated tree 'which is in the forest.'"

Commentary.—"The appropriated tree which is in the forest,
 i.e., the
 'it is a tree with goodly fruit and its right
 is in the person who has.'"

"Thus," observes Mr. Seebohm, "private appropriation in the possession of a tree on the land of the tribe is admitted." Indeed it will be noted throughout the examples given in this paper that in the case of trees, whereas tribal rights govern the land of the region, individual and exceptional rights are accorded in the ownership of trees. In my opinion this marks the stage from tribal and undivided jurisdiction to individual property, in realty individual property previously being confined to a man's weapons and implements of chase.

My own explanation of the reason for these ancient and common institutions being found in Hibernia may be known to some. It is that, like the female succession among the Picts dealt with by me in my paper under that title before the Royal Historical Society, these evidences belong to what for convenience has been called the Iberian or pre-Celtic epoch in these islands. Upon this head our President, Dr. Beddoe, has made many observations with regard to the physical remains, and Professor John Rhys has produced others bearing on the mythology. This matter of the Brehon law is another illustration of the like tendency.

In these islands, and in most European countries, the vestiges of these separate rights have ceased to exist. As Professor Maitland remarks, after long study of manorial records, the trees on copyhold tenements usually belong to the lord and not to the copyholder.

The nearest illustration that could be given me by that most eminent authority, Professor Sir Frederick Pollock, is from his own book, "*Pollock on Possession*," p. 34, in dealing with the case of *Stanley v. White*, in 14 East, 332.

The case is thus described :

Stanley v. White, 14 East, 332.

(*Head-note.*)

To an action of trespass for cutting down and converting trees, which the defendant justified as growing upon his soil and freehold, the plaintiff replied that the trees were his freehold, and not the freehold of the defendant; and this was held to be proved by showing that they grew on a certain woody belt, 15 feet wide which surrounded the plaintiff's land, but was undivided by any fences from the several closes adjoining, of which it formed part, belonging to different owners; and that from time to time the plaintiff and his ancestors, at their pleasure, cut down, for their own use, the trees growing within the belt, and that the owners of the different closes inclosing the belt, never felled trees there, though they felled them in other parts of the same closes, and that when they made sale of their estates, the trees in the belt were never valued by their agents, because they were reputed and considered to belong to the plaintiff and his ancestors, in which the several owners acquiesced.

Upon this Sir Frederick Pollock comments: (*Pollock on Possession*, p. 34.)

"The disputed ground was a belt of wooded land fifteen feet wide outside the plaintiff's enclosure. The land beyond this belt was owned and occupied by various persons, of whom the defendant was one.

"In an action against the defendant for trespass by cutting trees in the part adjacent to his own land, evidence was given of the conduct of owners and occupiers of other land similarly situated, besides the defendant's own predecessors in title; they had not attempted to take the trees within the fifteen foot belt, but on the contrary had both forborne from claiming them in any way, and had acquiesced in the trees being cut from time to time by the plaintiff or his predecessors. This was held admissible and sufficient evidence of the plaintiff's title to the trees

throughout the belt. If there had been the same positive evidence of trees being cut by the plaintiff, but no evidence of his exclusive right to do so being admitted by persons interested in disputing it if they could, the positive evidence would still have been admissible, but it may be doubted whether it would have been sufficient.

"For it would not have been inconsistent with a concurrent use and enjoyment by other persons."

With this exposition of existing law among ourselves the present history may close.

It will be seen that it deals with an institution widely spread in ancient or modern times in

Melanesia.

Borneo.

India.

Asia Minor, &c.

Turkey in Europe and the Balkan States.

Hibernia.

JUNE 25TH, 1889.

JOHN BEDDOE, Esq., M.D., F.R.S., *President, in the Chair.*

The Minutes of the last meeting were read and signed.

The election of The Right Hon. the Earl of SOUTHESK, K.T. of Kinnaird, Brechin, N.B.; JOHN ALLEN BROWN, Esq., F.G.S., of 7, Kent Gardens, Ealing; EDWARD ARTHUR DREW, Esq., of Wirksworth, Derbyshire; and FREDERIC JOHN MOUAT, Esq. LL.D., M.D., F.R.C.S., of 12, Durham Villas, Kensington, W., was announced.

The following presents were announced, and thanks voted to the respective donors:—

FOR THE LIBRARY.

From the INDIA OFFICE.—*Epigraphia Indica* and Record of the Archæological Survey of India. Parts 1, 2.

From the HEMENWAY SOUTH-WESTERN ARCHÆOLOGICAL EXPEDITION—*The Old New World.* By Sylvester Baxter.

From the GEOLOGICAL AND NATURAL HISTORY SURVEY OF CANADA—*A Grammar of the Kwagiult Language.* By the Rev. Alfred J. Hall.

- From the AUTHOR.—On the occurrence of Palæolithic Flint Implements in the Neighbourhood of Ightham, Kent, their Distribution and Probable Age. By Joseph Prestwich, D.C.L., F.R.S., &c.
- Notes on the Indian Tribes of the Yukon District and adjacent Northern Portion of British Columbia. By George M. Dawson, D.S., F.G.S.
- The Beginnings of the Carrying Industry. By Otis T. Mason.
- The Problem of the Ohio Mounds. By Cyrus Thomas.
- From the DIRECTOR-GENERAL OF STATISTICS, GUATEMALA.—Informe de la Direccion General de Estadistica. 1888.
- From the BERLIN GESELLSCHAFT FÜR ANTHROPOLOGIE, ETHNOLOGIE UND URGESCHICHTE.—Zeitschrift für Ethnologie. 1889. Heft 2.
- From the ROYAL SCOTTISH GEOGRAPHICAL SOCIETY.—The Scottish Geographical Magazine. Vol. v. No. 6.
- From the ANTHROPOLOGICAL SOCIETY OF WASHINGTON.—The American Anthropologist. Vol. ii. No. 2.
- From the ASSOCIATION.—Journal of the East India Association. Vol. xxi. No. 2.
- From the INSTITUTE.—Proceedings of the Canadian Institute. Vol. vi. Fas. 2.
- Annual Report of the Canadian Institute. Session, 1887-8.
- From the INSTITUTE.—Journal of the Royal United Service Institution. No. 148.
- From the SOCIETY.—Proceeding of the Society of Biblical Archaeology. Vol. xi. Part 7.
- Proceedings of the Royal Society. No. 279.
- Proceedings of the Royal Geographical Society. Vol. xi, No. 6.
- Proceedings of the Asiatic Society of Bengal. 1888. Nos. 9, 10.
- Journal of the Asiatic Society of Bengal. Vol. lvi, Part 2, No. 5; Vol. lvii, Part 2, No. 4.
- Journal of the Society of Arts. Nos. 1,906-1,909.
- Bulletin de la Société Impériale des Naturalistes de Moscou. 1888. No. 4.
- Boletim da Sociedade de Geographia de Lisboa. 8a Serie. Nos. 1 e 2.
- Mittheilungen der Anthropologischen Gesellschaft in Wien. xix Band. 1 und 2 Heft.
- Mittheilungen der Kais.-Königl. Geographischen Gesellschaft in Wien. 1888.
- Sechszwanzigster Bericht der Oberhessischen Gesellschaft für Natur- und Heilkunde.
- From the EDITOR.—Nature. Nos. 1,022-1,025.
- Science, Nos. 328-332.
- Revue d'Ethnographie. 1889. No. 1.
- Revue Scientifique. Tome xliii. Nos. 22-25

Professor VICTOR HORSLEY, F.R.S., exhibited and described some examples of prehistoric trephining and skull-boring from America.

His Excellency GOVERNOR MOLONEY, C.M.G., exhibited a collection of bows, &c., for the Yoruba country.

EXHIBITION of CROSS-BOWS, LONG-BOWS, QUIVERS, &c., from the YORUBA COUNTRY, by HIS EXCELLENCY GOVERNOR MOLONEY, C.M.G.

IN connection with his exhibits of cross and long-bows, quivers, arrows, messenger's staffs and Dahomian ironware, His Excellency made the following observations:—

On his last visit to England, in 1886, he was invited by Mr. A. W. Franks, C.B., to see the Christy Collection now in the British Museum, Bloomsbury, and his attention was called to an African cross-bow on which at the time he could throw no light. Whether it came from the Upper Nile or from West Africa he could not say; when an opportunity offered he determined to enlighten himself on the subject. The occasion presented itself when, on his reading a current issue of Yoruba proverbs by that dear and interesting old gentleman, the Right Rev. Dr. Crowther, Bishop Crowther, of the Niger, Governor Moloney came across the following:—

Akatanpó kò tò òjà ijà, ta li o mu igi wá ikòli ojú.

“A cross-bow is not enough to go to war with: whom do you dare to face with a stick.”

It so happened the Governor had with him at the time some messengers from the Chiefs of Ibadan, then stationed at their camp at Ekirun in Yoruba, some 250 and 300 miles from the coast line, and by the light thrown upon him through the above quoted proverb, he was able through the kind co-operation of the Chiefs of Ibadan to secure the specimens exhibited. Powder and guns have replaced (more is the pity for the country and for the world) the cross-bow; it is still, however, in use among some Yoruba speaking tribes, as is the long-bow. Where such use continues, it may be concluded that middlemen or intermediate tribes prevent, in self protection or to safeguard monopoly, the import of powder and shot.

The cross and long-bows were accompanied by their leather quivers full of reed or cane arrows. Yoruba bows are made of various kinds of wood very suitable for the purpose, and in the case of the cross-bow, the stock of which was grooved to receive the arrow or dart, the ingenious trigger deserved much attention.

In the bending of the cross-bow the feet are employed, the bow being first placed thereunder. For neither weapon is the arrow feathered, and only for the long-bow is it tipped, and cleverly so in various designs with iron; in both we find notches for the receipt of the string, which is made of a piece of bast as removed from the tree, from twisted native fibre, or deer or buffalo skin. The cross-bow quivers were of rough hide plugged up with corn pods, while those for the long-bows were interesting and handsome specimens of the leather industry of the Mohammedan Yorubas.

The cross-bow is called in Yoruba *akatanpó*, the long-bow *oron* or *orun*, the arrow for either *ofa*, while the quiver is named *akpo*, *adegunleakpo*, *aro*, or *ebiri*. In Dahomey, which is continuous with Yoruba on its east side, the bow is *dapo*, *dagbo*, the arrow *ga*, and quiver *go*. Some of the arrows were said to be poisoned, a practice very generally known in Africa.

As regards the messenger's staff, he exhibited it as a typical specimen of the class of brass and ironwork it represented, and of its current stage of development in Yoruba. The former material was imported in the shape of brass rods, while the latter was manufactured in the country from native ore such as he placed before the meeting, which he obtained from Ibadan. These staffs take various fantastic and gross forms, and are of varied material. They are entrusted to confidential followers, when native authorities represented thereby communicate with each other or with the Government. They are the *cartes de visite* of the native authorities, the badges of authority and recognition, the venerated credentials. The respect and awe extended to these sticks is astounding. They are called *okpa*, and the messengers entrusted with them *olokpa*.

The Dahomian axe, called in the vernacular *asio*, which may be viewed as essentially typical, presented a very advanced stage of ironwork, when were noticed the ingenious and useful capping and fixing of the blade as well as its exceptional polish. At ordinary times this weapon is carried suspended by its blade from the right shoulder.

DISCUSSION.

The PRESIDENT remarked that the use of the foot in bending the cross-bow was not peculiar to the Yoruba people: it was practised also by cross-bowmen in Europe in the middle ages.

General PITT RIVERS observed that the cross-bow exhibited by Governor Moloney, from the Yoruba Country, was exactly like that used by the Fans of the Gaboon, some of which, brought home by Du Chaillu are in his collection at Oxford. They are

identified together by the peculiar contrivance for releasing the string, which is unlike that of other countries. The cross-bow is also known to be used on the coast of the Bight of Benin. Its use, he thought, could not be traced to the east coast of Africa, although Grant mentions that the children at Ukuni make toy cross-bows, which may perhaps be taken to imply that it was at one time used there. He was not aware that the cross-bow was used in India, but it was used in the Nicobar Islands, and by the Kairens, on the Martaban coast of Pegu, and in Assam; also by the Stiens of Cambodia and in Burmah. It is used in Japan and in China. The cross-bow on the west coast of Africa must therefore be either an independent invention, or be derived from European cross-bows of the middle ages.

The following Paper was read by the Author :—

On POISONED ARROWS in MELANESIA.

By the Rev. R. H. CODRINGTON, D.D.

POISONED arrows are used in the Solomon Islands, Santa Cruz, the Banks' Islands, the New Hebrides. In parts of the Solomon Islands, and in parts of the New Hebrides the common fighting weapon is the spear; but the use of the bow and poisoned arrow is occasional. In the Torres Islands, and in Lepers' Island in the New Hebrides, arrows are used for fighting which are not poisoned, yet belong entirely to the same class of weapons with those that are. When the word poison is used it is necessary to understand in what sense it is applied. The practice of administering poison in food was certainly common among the natives. I very much doubt, however, whether what was used had ever more than a very little power of doing harm; whether anything used was poisonous in a proper sense of the word, before returning "labourers" from Queensland brought back arsenic with them. Certainly the deadly effect of what was administered was looked for to follow upon the power of the incantations with which the poison was prepared. In the same way the deadly quality of these arrows was never thought by the natives to be due to poison in our use of the word, though what was used might be, and was meant to be, injurious and active in inflaming the wound; it was the supernatural power that belonged to the human bone of which the head was made on which they chiefly relied, and with that the magical power of the incantations with which the head was fastened to the shaft. Hence the Torres

Island and Lepers' Island arrows, which have no poison, were as much valued, trusted, and feared as the others; and in Lepers' Island both kinds were used.

I first examined and inquired about these arrows in the Banks' Islands in 1870, and I exhibit one from Santa Maria in that group. They do not differ materially from those made in the Northern New Hebrides, or from the very formidable weapons from Santa Cruz which are here. In construction and in the way of applying the poison they are identical, though different in ornamentation and weight.

There is a common structure of all the arrows which have the head of human bone, whether poisoned or not. There is the shaft of reed, the foreshaft of hard wood (tree-fern or palm), and the point of human bone; one part let into the other, and firmly bound with fine string or fibre. This is well seen in one of the unpoisoned arrows from the Torres Islands.

There is a great difference in size and weight. Santa Cruz arrows are uniformly nearly four feet long, and weigh about two ounces. The Banks' Island arrows are about 3 feet 9 inches in length, and weigh about an ounce. The Torres Island arrows are only 2 feet 10 inches long, and weigh three-quarters of an ounce. The bone point of a Santa Cruz arrow is 7 inches long, and the foreshaft of hard wood, which is curiously carved and coloured, is 16 inches long. The bone head of a Torres Island arrow is 12½ inches long, and the foreshaft 8 inches, the reed shaft being 20 inches. The one is a heavy and powerful weapon requiring a large and powerful bow, and is by far the most formidable missile of the kind; the other is slight and weak, little more than the human bone fitted for the bow.

It is the human bone which in native opinion gives to the arrow its efficacy. The bone of any dead man will do, because any ghost will have power to work on the wounded man; but the bone of one who was powerful when alive is more valued.

In Lepers' Island not long ago, a young man out of affection for his dead brother, took up his bones and made them into arrows. He carried these about with him, and did not speak of himself as "I," but as "We two," his brother and himself, and he was much feared; all the supernatural power of the dead brother was with the living. In Maewo the story is that a blind man, Muesarava, invented these deadly arrows in a time of war. While the enemies used arrow-heads of bird or fish-bones, and those wounded by them recovered, all who were hit by Muesarava died. When his enemies inquired how this came about, he told them to dig up one of the men he had killed and use his bones. This they did, and shot him, and he died. This original bone arrow-head still remains in the possession of the

brother of a friend of mine; when a quarrel arises it is enough to bring that out and point it at the disturbers of peace.

It is the human bone which gives the deadly quality to the arrow; but yet the bone must be made into an arrow with the use of certain incantations which add supernatural power, *mana*, as it is most commonly called. The maker sings or mutters this charm as he ties the bone to the foreshaft; and hence I have been told that the supernatural power is put in where the bone joins the foreshaft. The knowledge of the incantation is confined to few; but still if a man should, like that young man at Oba, make his arrows from the bones of some one he knew, and call on the ghost, as he would be sure to do, in binding on the head, no doubt his arrows would be effective.

The poison is an addition to the power of the bone; the magical efficacy of the poison is added to the supernatural power residing in a dead man's bone. The native did not much consider, if at all, the natural power to hurt of either bone or poison. A fine point of bone breaking off deep in a wound must be most dangerous; pungent and burning juices smeared on the arrow-head may well inflame a wound. It was not, however, to natural effects that the native looked at all. A dead man's bone made the wound, the power of the ghost was brought by incantation to the arrow, therefore the wounded man would die. Euphorbia juice is hot and burning; it is smeared on the bone with an incantation which calls in the power of a dead man's ghost; when the wound is given the ghost will make it inflame.

The cure of the wounded man is conducted on the same principle. If the arrow-head, or a part of it, can be recovered, it is kept in a damp place or cool leaves; the inflammation of the wound is little, or subsides. Shells are kept rattling over the house where the wounded man lies to keep off the hostile ghost. In the same way the enemy who has inflicted the wound has by no means done all that he can do. He and his friends will drink hot and burning juices, and chew irritating leaves; pungent and bitter herbs will be burnt to make an irritating smoke, and will be tied upon the bow that sent the arrow; the arrow-head, if recovered, will be put into the fire. The bow will be kept near the fire, its string kept taut, and occasionally pulled, to bring on tension of the nerves and the spasms of tetanus.

I will now describe the preparation of the poisoned arrows as it has been described to me, for I have never seen the thing done. Here is an account of it written by a native of Maewo Aurora, in the New Hebrides:—"When they have dug up a dead man's bone they break it into splinters and cut it properly into shape, and sit down and rub it on a stone of brain coral with water. After that it is fixed into a bit of tree-fern wood; every-

one cannot do that, it is some one who knows. When that is done, the thick juice of the *no-to* (*excavaria agallocha*) is put upon it. Then it is put in a cool place on the side wall of a public hall, and no fire is made there so that the cold may strike upon it and it may turn like mould. Then they dig up the root of a creeper they call *loko*, and come back and take off the bark and scrape the inner fibre into a leaf; and that, wrapped in another leaf, is put upon the fire. When it is cooked, this is wrapped in the web from the spathe of a cocoanut, and squeezed into a leaf of the nettle tree. Then, with a piece of stick, they smear it on the point of bone to help the *toto*. After this it is put again in a cool place, and swells up in lumps, which as it dries become smooth again. Then it is fastened to the reed, and bound round with a fine string. After that they take a green earth, which is only found in one spot, and paint it over. When it has been painted they take it to the beach and dip it into the sea-water till it becomes hard: then the *toto* is finished."

In the neighbouring island of Whitsuntide they finish with stuff found on rocks on the shore, and thought to be the dung of crabs, which is thought to have much magic power.

In Mota, in the Banks' Islands, the poison is made from the root of a climbing plant, *loki*, cooked over the fire with the root of pandanus. This mixture is black and thick, and is smeared on the points of human bone, which are put in the sun to dry, and then kept five days indoors wrapped up, when the stuff turns white. Another poison which causes more inflammation and acts more quickly is got from the *toi*, an euphorbia.

At Santa Cruz the foreshaft is of palm wood, carved with shark's tooth or shell. The bone head is covered with ashes and with the preparation which gives supernatural power. The foreshaft is bound at intervals with a string of fibre, which is covered with the same substance which covers the bone point. I feel sure that this binding is done with incantations which fasten supernatural qualities on the arrow.

The common result of a wound with these arrows is certainly tetanus, which is what is expected. Even if, however, the *loki* be, as has been supposed, some kind of strychnine, that is not the cause of the disease. After the lamented death of Commodore Goodenough, Dr. Messer, R.N., clearly established, I believe, the harmlessness, or comparative harmlessness, of the so-called poison on the arrows. For my own part, I have only desired to set forth the native view of the matter, which is of course quite independent of scientific research.

It may be asked how the very common belief has arisen that these arrows were poisoned with putrefying human flesh. I think that it arose when natives answered "dead man" to the

early traders' inquiries. The native meant that the bone was human, and the deadly power of the weapon derived from ghosts. The European thinking of poison, not of magic, supposed that the poison was from a corpse.

In conclusion, let me call attention to the beautiful and elaborate ornamentation of the shaft from the Banks' Islands. This was executed with obsidian in Santa Maria, where certain men used in former days to make their livelihood by their art. This shaft adds some illustration to Mr. Balfour's paper read in January, 1888

DISCUSSION.

The PRESIDENT thought Dr. Codrington's description of the preparation and properties of the arrows was extremely clear: it explained the uncertain but often very formidable results of wounds inflicted with these arrows.

Prof. VICTOR HORSLEY wished only to suggest that possibly the original value of the human bone tipping the arrow was first made evident by the employment of bone from a corpse recently dead, and in the decomposing tissues of which consequently the septicæmic virus would be flourishing. He also referred to the case published recently in the "British Medical Journal" by Mr. White, of Nottingham, in which a servant maid wounded herself with a poisoned arrow from a trophy, the symptoms being those of curare poisoning, and successfully treated as such.

His Excellency GOVERNOR MOLONEY remarked that he felt sure he was only expressing the general view of the meeting when he said that the paper which had just been read was one of importance and considerable interest. It might, however, be inferred therefrom that aborigines knew nothing of the use of poison for arrow tips until they were so instructed by aliens, who also had been the channel of supply of the necessary commodity.

Speaking of the African Continent, this was not his experience; the practice seemed extensively known. At the Gambia among the Mandingoes, who still employed the bow, the use of vegetable poison from a *Strophanthus* for arrow tips was general, and he would say the same of Yoruba, whence he had succeeded in bringing home to the Royal Gardens, Kew, living specimens of what is considered a new species of *Strophanthus*, which yields a poison used much for a similar purpose. The *umtsuti*, or poison plant of South Africa, is *Strophanthus hispidus*, and *wanika*, an arrow poison of the East Coast, is said to be from the root of the same. Again, we must remember the *hippo*, *kombé*, and *vakamba* arrow poisons. Finally, we have heard or read of the *Inée*, or *Onaye*, of Gaboon, a *Strophanthus* poison used to a like end. Doubtless there were many other poison-yielding plants known in use by the natives of Africa.

The following Paper was read by the Secretary :—

On the STRUCTURE and AFFINITIES of the COMPOSITE BOW.

By HENRY BALFOUR, M.A., F.Z.S.

[WITH PLATES V AND VI.]

CONSIDERABLE attention has been paid to the history of the bow by General Pitt Rivers, who, in his catalogue of his anthropological collection, published in 1877, has given an admirable general account of this weapon, the result of very careful research in a field at that time but little investigated. To him is due the credit of having first pointed out the necessity for dividing the varieties of the Bow into two principal groups called by him the "Plain Bow" and the "Composite Bow" groups respectively. He has entered, moreover, very fully into the question of the geographical distribution of the varieties, and has pointed out how the "Composite Bow," the offspring of necessity, originated as a copy of the "Plain Bow," in regions where suitable materials for the latter were not available. The series of specimens illustrative of this subject in the Pitt Rivers' collection, lately presented to the University of Oxford, is a very representative one, and in working at this series during the arrangement of the collection in the Oxford Museum, I was tempted to investigate further the structure and affinities of bows of composite nature.

Apart from the writings of General Pitt Rivers very little appears to have been written to describe the *complex structural peculiarities* of the higher types of the composite bow, and that little, so far as I have been able to ascertain, is for the most part extremely vague and superficial.¹ This is all the more curious when we consider that this species of bow has been in use in its most highly specialized form for a very considerable time, and has been mentioned by countless writers, both ancient

¹ Mr. J. Murdoch has written a very complete account of the sinew backing of Esquimaux bows ("Annual Report of Smithsonian Institute," 1884, Pt. II, p. 307). Ascham's "Toxophilus," Hansard's "Book of Archery," and W. Moseley's "Essay on Archery" (1792), give general accounts of bows, but their descriptions are many of them very unreliable and incomplete. The most recent general paper on the subject is D. N. Anuchin's "Bows and Arrows," in the "Transactions of the Tiflis Archaeological Congress," Moscow, 1887. 4to. This contains a very interesting general account, illustrated. I am much indebted to my friend Mr. W. L. Morfill, for very kindly translating that portion which bears specially upon the subject of my paper. I have added notes from this paper in footnotes, as I was unfortunate in not obtaining a copy till my own paper was completed.

and modern. As regards its powers and the skill of Asiatic archers much has been written, and its eulogy has been uttered in the most extravagant terms, and with this I do not purpose to deal, but merely propose to confine myself to a description of the details of the anatomy of the higher types, with mention of some of the more primitive types for comparison, and of some forms allied to the composite bow. I recently had passed on to me by Dr. Tylor the half of a broken Persian bow, of excellent workmanship, and probably of considerable age (perhaps 200 years), which was sent to Oxford with other Persian weapons by Colonel Sir R. Murdoch Smith. This I cut into sections for the purpose of displaying its structure, described below, and this led me to investigate the anatomy of one or two other allied forms by way of comparison.

Before commencing a description of the structure of the more highly specialized forms, it may be well briefly to mention a few points in connection with those forms which shew a more primitive construction, and which may be taken as illustrating, to some extent at least, the stages in the evolution of the highly complex types which complete the series. The distribution of the composite bow is too well known from General Pitt Rivers' writings to need examination here. The more prominent types are those of the Eastern and Western Esquimaux, of some races of North-West America, and the Tatar and Persian forms, there being various offshoots from each of these forms.

In the more northerly regions of Central Asia (where, as pointed out by General Pitt Rivers, it seems likely that, from the lack of suitable wood for long-bow making, the use of a combination of materials for producing bows on the model of the older "self" bow originated), the earlier and more primitive forms have died out. We have therefore to seek elsewhere, in the more barren regions into which this form of bow has extended, for the primitive types which may serve to illustrate the struggles of the early bowyers in their attempts to produce a serviceable weapon.

The most primitive type now existing is that found among the Eastern Esquimaux, consisting of a piece of drift-wood (or two or more pieces of wood, whale-rib, or horn spliced together¹) "backed" with a cord of plaited or twisted sinews, which is fixed by an eye-loop to one of the nocks of the bow, and is wound up and down between the nocks, passing round them. A bundle of cords is thus formed, stretched tightly between the ends of the bow, and to a great extent covering the "back." Sir Martin Frobisher described this form of sinew backing as

¹ Anuchin mentions the following materials as added to the wood sometimes:—Whalebone, stag (? cariboo) horn, musk ox horn, or walrus tooth.

"not glued to, but fast girded on." Sometimes, even in the roughest specimens, the longitudinal lacing is gathered up into a compact rope by spiral binding. There are further cross lacings passing round the body of the bow and the backing, so as to keep the latter close against the former.

A specimen from the Barrow collection in the British Museum from Whale Fish Island (?) is backed with a lacing of raw hide, gathered into two bundles twisted up, with a cross lacing of the same material. A second in the British Museum from Parker Bay, Victoria Land, consists of roughly spliced bones reinforced at the back with short *whalebone* (baleen) strips. Crantz also mentions this material as used for backing Greenland bows. I have figured (Plate V, Fig. 1) a bow of this simple type obtained from the Eastern Esquimaux by Captain Lyon, R.N., *circa* 1825. In this specimen the body is of a single piece of drift pine, thick and clumsy; the tension of the sinew backing in this, as in most cases, causes the bow to assume the opposite curve to that of the weapon when strung for use. It frequently happens that the bows of the Eastern Esquimaux assume a very unsymmetrical shape, from the rough splicing and the unequal strength of the parts.

When the body is composed of more than one piece of bone, the pieces may be united by being overlapped and fixed with sinew thongs passed through holes, or with rivets of old ships' nails, or by splicing. In the latter case the joints are often strengthened by additional short pieces placed on back and front, with a splicing line bound round the whole.

The Esquimaux bows have been so well described in detail by Mr. John Murdoch¹ that I need not enter into the details of the various modes of "backing" characteristic of the different regions of Arctic North America, my purpose being merely to describe the prominent types which seem to indicate the various epochs in the history of this weapon. Mr. Murdoch refers his three well-defined western types to a single primitive ancestral form, of which the bows of the Eastern Esquimaux with simple backing, such as that described above, are but slightly modified survivals. He cites as an example a bow from Cumberland Gulf of very primitive construction.

In the western regions of the Esquimaux, where the materials are of better quality, and the workmanship far superior, owing no doubt to the ready access to the higher civilization of the West, in the proximity to the Asiatic Continent, the style of backing is more complicated. The cross lacing round the wood, especially, is usually more elaborate; occasionally, as in the specimen figured (Fig. 2), obtained by Capt. Beechey in 1826,

¹ *Op. cit.*

to the N.E. of Icy Cape, forming a close transverse binding over the greater length of the bow, the central grip and two extremities alone remaining free. By this means the longitudinal cords are brought into close contact with the wood, and the whole becomes stronger and far more compact. The backing is wound between the nocks as in the eastern forms, but the strands are gathered up closely to form a compact rope-like bundle, kept close against the body by the transverse binding, except at the ends where the strands are more free and less compactly packed. Generally the sinews are twisted together into a single or double rope by means of small ivory levers.

Many of the Western Esquimaux bows appear not to be of drift wood, but of wood of better quality, though Beechey describes bows from Kotzebue Sound as being of drift pine. He, however, mentions bags of resin "which appeared to be the natural exudation of the pine. From their constantly chewing it, it did not seem difficult to be had." In all probability they have fairly easy access to living trees, and frequently make their bows of the live wood.

Many bows from the western regions of North America have strips of horn, or ivory, or whalebone between the backing and the "body," and occasionally strips of hide are added; the backing is moreover frequently tightened by the insertion of small plugs. The wood is often painted over with various designs, and these bows also often exhibit the shape characterised as the "Tatar" shape, of which the specimen figured (Plate V, Fig. 2) is a good example. The two ends are bent suddenly away from the general line and are straight, the angles or "elbows" being emphasized in the unstrung state.

The close cross binding occurs most frequently at the "elbows," which, when the bow is strung, have to withstand a somewhat severe strain; but, as seen above, in many cases extends more or less towards the central "grip."

The "Tatar" shape is doubtless derived directly from the Asiatic Continent, ready access being afforded by the narrow Behring's Straits. It extends certainly as far as Hudson Straits. Capt. Beechey mentions¹ the close resemblance between bows of St. Lawrence Island, Behring's Straits, and those of the Tchuktschi. He lays stress upon the many points in common to be observed in the two races. Capt. Belcher² also points out the connection between the peoples of Arctic Asia and America. He says, "The bows of the Esquimaux are either in one single piece steamed to form, or at times composed of three pieces of

¹ "Narrative of a Voyage to the Pacific and Behring's Straits," 1831, p. 243.

² "Trans. Ethnol. Soc.," Vol. i, 1861, p. 129.

drift wood, and it has always appeared to me that their object has been to produce a form very similar to the strung bow of the Tartars, and *totally dissimilar* to the tribes of Indians on the American shores southerly." Dr. King, in his description of the Esquimaux, writes,¹ "The Esquimaux of Behring's Straits bestow much care in giving the bow the proper form, and for this purpose they wrap it in shavings soaked in water, and hold it over a fire for a time; it is then pegged to the earth in the form required. By the assistance of the sinews at the back the bow preserves its elastic power, and by slackening or tightening them it is rendered weak enough for the child or strong enough for the most powerful man, and when fast girded it causes the implement, when unstrung, to turn the wrong way. They have also the power of altering the length of their bowstring to their pleasure by twisting the several strings, often 15 or 20 plaits, of which it is composed. Some of the warlike tribes of Behring's Straits muffle with fur the horns of their bows to deaden the noise of the string against them."

To enumerate the several Esquimaux varieties of what I should propose to call "free" sinew backing (as opposed to the backing of sinews *moulded* on to the wood or horn, which may for convenience be called "close" backing), would be merely to repeat the substance of Mr. Murdoch's paper; and I shall here leave this form and pass to a very distinct type, which may well be regarded as a survival of an early form in the direct line which has led to the perfected Asiatic bows. The peculiarity of this type, which is distributed over a fairly wide area of North-West America, is that, instead of the sinew backing being composed of plaited sinew cords, kept close to the bow by means of cross binding of similar material, it consists of a *mass* of sinews² taken from the back or neck of some animal, not divided up into strands or cords, but moistened and then moulded in layers directly on to the surface of the bow, so that the whole forms a very compact weapon, the composite structure being far less obvious than in Esquimaux bows with "free" backing. In making these bows, as Sir E. Belcher tells us, the wet layers of sinew are applied so as to entirely encase the wood: "The horns of the bow are also moulded entirely from it, and, when dry, it presents the translucent features of horn. The face of the bow is then polished off to show the wood. These bows are preserved with the utmost care in fur cases to prevent moisture reaching them, by which their strength would be materially diminished."

¹ "Journ. Ethnol. Soc." Vol. i, p. 293.

² Burton mentions bows of the Sioux and Yutas with a backing of *raw hide*. Is it possibly this solid mass of sinews that he has described under this term?

Catlin¹ gives an interesting description of the bows of the Blackfoot tribe (between the Missouri and the Yellowstone, about 34° W, 41° N.), which I quote in his own words: "The length of these bows is about three feet, and sometimes not more than two and a half. They have, no doubt, studied to get the requisite power in the smallest compass possible, as it is more easily and handily used on horseback than one of greater length. The greater number of these bows are made of ash, or of 'bois d'arc' (as the French call it), and lined on the back with buffalo or deer's sinews, which are inseparably attached to them, and give them great elasticity. There are very many also (amongst the Blackfeet and the Crows) which are made of bone, and others of the horns of the mountain sheep. Those made of bone are decidedly the most valuable, and cannot in this country be procured of a good quality short of the price of one or two horses. . . . The bone of which they are made is certainly not the bone of any animal now grazing on the prairies, or in the mountains between this place and the Pacific Ocean; for some of these bows are three feet in length, of a solid piece of bone, and that as close-grained, as hard, as white, and as highly polished as any ivory. . . . It is my opinion, therefore, that the Indians on the Pacific Coast procure the bone from the jaw of the sperm whale, which is often stranded on that coast, and, bringing the bone into the mountains, trade it to the Blackfeet and Crows, who manufacture it into these bows without knowing, any more than we do, from what source it has been procured."

I have figured (Plate V, Fig. 3) a good example of this kind of bow, which was obtained by Capt. Belcher in California, now in the Pitt Rivers collection. In some of the bows of this type the sinew layer is moulded on the back from end to end and bound round at the ends with sinew strands, and sometimes porcupine quills in addition, to prevent its coming away from the surface of the bow; but in others, as, *e.g.*, the Californian bow figured, an advance on this is observed in the sinew layer being moulded so as to enclose completely the last inch or so of both ends, thus doing away with the necessity for binding at the extremities. In these latter forms the sinew extends beyond the ends of the wood or horn body of the bow, and forms solid tips, which are so moulded as to form the nocks. Nearly all are bound round at the centre with thongs of hide, or other material, for the hand grip. In order to give a firm hold to the sinew, the surface of the "back" of these bows is scored over with deep scratches, so as to present a rough surface. A marked recurved outline in the unstrung state is frequently exhibited, from the tension of

¹ "North American Indians," fifth edition, 1845, p. 32.

the sinews, as will be seen from the figure, the curve in this specimen being of a very regular **C** shape.

This method of backing must have proved a distinct advance upon the presumably older system of "free" backing. This compact and powerful weapon appears to have been especially adapted for use on horseback, as it has been favoured particularly by the horse-riding tribes. It is moreover the form which has been worked up to the state of greatest perfection on the Asiatic Continent. The sinew backing is sometimes reddened, sometimes blackened, or it may be left of its natural colour, as in the one figured. The Ossage and Modoc tribes and many others used this bow, and General Pitt Rivers has stated his belief that "occasionally it is used as far south as Peru."¹

Of the Esquimaux and North-West American bows, I have described three prominent varieties:—1. That of the Eastern Esquimaux, with its simple backing laced from end to end, roughly made, and presenting a very primitive structure; 2. That of the Western Esquimaux, shewing well-made examples; the backing still of plaited sinew laced between the ends, with, in addition, a more or less complicated system of cross lacing, many of the bows being painted, though in none is the sinew backing concealed beneath an ornamental covering; the shape frequently betraying the influence of the proximity to the Asiatic Continent, in the appearance of the "Tatar" outline; 3. The North-West American form, in which the sinew is moulded closely on to the surface of the bow, and is sometimes painted over, these bows being usually short and very compact.

For the higher forms we must turn to the Asiatic Continent, and I will again only describe the more prominent varieties characteristic of different regions, without going into the details of the numerous subvarieties more than necessary.

The descriptions of bows by the early classic writers are more or less vague, and no mention, so far as I know, is made of sinew "backing," though, from the accounts of the shapes of many varieties, there is little doubt that this kind of reinforcement was in vogue at a very early period. In the *Iliad*² the bow of Pandarus, the Lycian, is described as of mountain goat's horn, without mention of other materials to indicate a composite structure. At the same time the poet ascribes to the bow of Odysseus³ a prodigious power which is not easily reconciled with the material, plain horn of considerable length (I assume that both these bows are of the same type). The great strength and the effort and knack required for stringing and drawing such

¹ "Catalogue of the Anthropological Collection," 1877, p. 51.

² "*Iliad*," Book iv, 105.

³ "*Odyssey*," Book xxi.

a bow, is more easily explained by supposing that those from which Homer drew his description were of composite structure, with a powerful reinforcement of sinews moulded on to the back and probably concealed by an ornamental layer of some kind. In the higher forms of composite bow, one of the chief characteristics is the artful concealment of their composite structure beneath coats of bark and lacquer. From the expression, *νευρή*, we gather that the bow-string was of sinew, and we also learn that the bow of Odysseus was carefully kept in an ornamental case,¹ after the fashion of Asiatic archers using the composite bow. The few examples of bows composed of horn alone, existing at the present day, do not appear to be of very exceptional power, and certainly not of sufficient strength to resist the efforts of men trained to the use of this weapon, as were the suitors of Penelope.

There is no doubt that the Parthian, Dacian, and Scythian bows of antiquity were "composite" bows of somewhat similar structure to those of modern Persia or China, as we have evidence that the Persians derived the bow, which they afterwards brought to such perfection, from the Scythians. According to Rich² the Scythian bow was shaped in two bays, one smaller than the other, and resembling the early Greek Sigma Σ . Hercules is figured carrying an unequally curved bow of this kind, possibly representing the one which he obtained from Teutarus, a Scythian shepherd, as opposed to that which he received from Apollo, which was necessarily a "Greek" one, and symmetrical. The Scythian bow as usually represented is symmetrical and, in the unstrung state, regularly curved in a C shape, resembling the type most characteristic of modern Persia. The unequally curved bows may have been so made for the purpose of enabling the archer to draw the arrow in a line from the exact centre, or the bows may have been distorted in the representation.

To return to the bows of modern times.

Amongst the Chukches of Easternmost Siberia, as one would expect from the proximity to the shores of Alaska, the form of the bow bears a strong similarity to that of those of the Western Esquimaux. It appears from the narrative of the Vega Expedition that the modern Chukch bows are very degenerate and of inferior manufacture, though the older bows were of finer make. These were larger and made with greater care, "covered with birch bark and strengthened by an artistic plaiting of

¹ " $\alpha\upsilon\tau\omega\ \gamma\omega\rho\upsilon\tau\omega, \delta\varsigma\ \omicron\iota\ \pi\epsilon\rho\acute{\iota}\kappa\epsilon\iota\tau\omicron\ \phi\alpha\epsilon\iota\nu\acute{o}\varsigma,$ " *Odyssey*, **xxi**, 53.

² Dictionary of "Roman and Greek Antiquities."

sinews on the outer side." This birch bark covering is a strictly Asiatic characteristic, whereas the *plaited* sinew reinforcement is chiefly peculiar to North America. Further west, among the Tunguses, the bows shew a close relationship to the Tatar form, described below, both in general outline and in structure. A Tungus bow in the British Museum, of markedly "Tatar" form, is mainly built up of wood, a double layer running along the "arms," with a fairly thick reinforcement of sinew moulded closely along the back as far as the commencement of the straight "ears."¹

The "backing" is entirely covered with thick birch bark, scored over with ornamental grooves and scratches. The "ears" are short and of solid pieces of wood, with small bone wedges let into the ends, to give strength to the nocks, which, oddly enough, are in this specimen situated at the extreme ends, and not just below the ends, as in most bows. The ridges below the "ears," so characteristic of the higher Southern forms, are here only slightly marked, the "ears" thickening rather suddenly. The "grip" is of wood, covered with birch bark, and bound at the centre with hide thongs. The belly is composed of a strip of horn along each "arm" reaching to the bases of the "ears," almost entirely exposed, except for a slight overlapping of bark round the edges. The horn is very thin indeed, and can hardly have been of great service in increasing the strength and elasticity of the weapon, and was probably added to this bow more for the purpose of carrying out the "Tatar" design, in spite of scarcity of suitable material, than for real use. The edges of this bow are finished off with bone strips, and there are bone bridges at the "elbows" for the bow-string.²

A second Siberian bow in the British Museum is from the Bashkirs, a nomadic tribe in the Ural district, in the govern-

¹ For convenience, I may here explain the terminology used:—

Back = The side which in most of these bows is concave when unstrung, becoming convex when strung.

Belly = The side opposite to the back, which is nearest to the archer when shooting.

Arms = The flexible portions lying between the central "grip" and the rigid extremities.

Shoulders = The points where the bow suddenly narrows laterally to form the terminal "ears."

Ears = The inflexible extremities beyond the arms, at the end of which are the nocks. They are usually termed the "horns," but in dealing with the anatomy of the composite bow an obvious confusion is avoided by substituting this word.

² Anuchin (*op. cit.*) describes the Tungus bow, from a specimen in the Moscow Museum, as made of two kinds of wood, fastened tightly with yellow (? inner) birch bark; on the back (*i.e.*, "belly") are fastened horn strips, except in the middle, where the bow is held for bending, and at the ends pieces of bone are attached, in which notches are made for the cord ends.

ment of Orenburg. This specimen exhibits the so-called "Cupid's bow" shape very strongly. It is roughly made. The wooden base is fairly thick along the "arms"; the sinew backing is powerful and covered with thick birch bark; the "back" is slightly concave in cross section, and the "belly" very convex. The horn layer on the "belly" is thicker than in the preceding specimen, but is thinned down towards the "ears"; it is entirely exposed, except at the "grip." The ridges below the "ears" are fairly marked and apparently shaped in the wood, and not by moulding the sinew; the "ears" short, with partial covering of bark, wound spirally round them; and the nocks are just below the extremities. At two points on the arms there are supplemental transverse bindings to keep the horn strips in place, but these have evidently been added since the bow was finished, and are for mending rather than part of the necessary structure. There are bridges at the elbows for the bow-string.

A bow described by Erman deserves mention here¹: "A very powerful bow, also made of fir, is in use by the natives dwelling on the Northern Obi, and is stated to be the peculiar manufacture of the Kasuimski. The bow is strengthened by thin slices of the horn of the fossil rhinoceros, *R. tichorhinus*, very neatly joined to the fir by fish glue, and requires great dexterity to bend it fully. The Kasuimski are inhabitants of the banks of the Rivers Kas and Suim."² It is possible that fossil horn has been frequently used as a substitute for the more serviceable buffalo horn of the higher types.

Turning now to the bow known as the "Tatar" bow, which has given rise to the so-called "Kung"³ bow of China, an advanced type is reached, and better workmanship displayed, than in any of the preceding examples. The backward curve when unstrung, and the "Cupid's bow" shape when strung, are strongly marked in this type. Externally it shows a thick and strong rounded layer of black horn lying along the belly, completely uncovered and extending to the base of the "ears." Each "arm" has a single piece of horn. The "ears" are bent down sharply at the "elbows," and are nearly straight; at the extremity of each a wedge of horn may be let in to strengthen the nocks, and the actual tip beyond the nocks may be entirely

¹ Quoted from Richardson's "Polar Regions," p. 308.

² These two rivers flow into the Yenesei in about latitude 60° N.

³ "Kung," 弓 in Chinese, means any kind of bow, so that it cannot be used as an adjective to describe this particular form of bow. The word Nu, a cross-bow, becomes when written 弩, which is a combination of a phonetic character sounded Nu, and the radical Kung, which has been added in order to express the thing visibly, as meaning a bow of some sort.

I am indebted to Mr. F. H. Balfour for the above note.

of this horn, but in the commoner examples the occasional presence and desirability of this addition is indicated by painting the wood black beyond the nocks, thus giving the appearance of horn.

The back is covered with birch bark, applied in rhomboidal pieces, giving the appearance of a spiral winding. The bark extends as far as do the backing sinews, and completely conceals them. In the commoner specimens the bark is left in its natural state, but in finer examples, and especially in the better Chinese bows, it is covered wholly or partially with paint and with elaborate designs in thin cardboard stuck on to the surface and varnished over. Along the edges run narrow strips of horn or cane, which conceal much of the inner structure. The central grip is usually bound round transversely with sinews and in the better examples covered with thin cork or leather. The ridges are always well marked. The nocks are occasionally at the extreme tips as in the Tungus bow above. I dissected one of these bows, of the rather commoner sort, in order to show its structure more in detail. Plate VI, Figs. 4–8, refer to this specimen, and the description may, I think, be taken as fairly characteristic of all bows of this type.

Fig. 4 shows a tranverse section through the middle of one of the "arms." Along the centre runs a flat piece of cane (a^1) of the same width nearly as the "arms"; to this, on the belly, is neatly and firmly glued a thick piece of horn (b), flat on the inner and convex on the outer side. On the back there lies firstly a layer of sinews (c^1), longitudinally disposed, partly mixed with glue, and adhering very closely to the cane; over this is a second layer (c^2) of mixed sinews and glue, the proportion of glue being greater in this than in the lower layer. These two layers are turned round the cane so as just to meet the horn at the sides, and here are seen the two thin strips of horn ($d-d$) which conceal externally the point of juncture of the several component materials. Over the second stratum of sinew is a layer (e) of fine, delicate inner bark of birch, overlying which is the external layer of coarser bark. The region at which this section has been cut is that where the greatest flexibility is required, and where the bow is flattest and widest, though in this type the width does not vary greatly along the "arms."

Fig. 5 is taken from a *dissection* of the same part showing the succession of the layers, a portion of each layer being removed to display the one lying immediately below. The letters correspond with those in Fig. 4.

Fig. 6 shows a tranverse section taken at the sudden bend or "elbow," which indicates the commencement of the "ear." In this region there is a prominent ridge which gradually rises and

shades off into the "ear." In the section it is seen that the cane is replaced by hard wood (a^2) with a triangular cross section which produces the shape of the ridge. Over the "belly" side lies the horn, very thin at this point; it terminates a little way beyond this point. On the back are seen the continuations of the two sinew layers c^1 , c^2 . The external bark layers are the same as before.

In Fig. 7 is seen a transverse section through the centre of the handle or "grip." Here the centre is composed of both cane and hardwood; the cane a^1 is in direct continuation from the "arms"; the hardwood serves to pad out the handle in order to fit the grip comfortably. The horn, b , is very convex here, and this section cuts through the point of meeting of the two horn strips, which together cover the belly as far as the "elbows"; so that here the end of one of the pieces is represented. The longitudinal sinews are disposed as before. The bark does not extend over the handle, but, as mentioned above, in its place there are coarse sinews, g , wound transversely round in a slightly spiral manner, the ends of which are seen cut across in the section. In the more elaborate specimens there is a layer of shark skin, covering the grip, with thin cork overlying the whole, and affording a good hand-hold.

Fig. 8 is taken from a longitudinal section through the whole of the grip, and shows on a reduced scale the extent and form of the plug of hardwood, a^2 , and how it ekes out the shape of the hand-hold; the meeting of the two horn strips, b , b , is also seen.

The specimen from which the above description is taken is by no means a fine specimen of its kind, but may be taken as fairly typical of the "Tatar" variety, as the different examples seem to vary more in external finish than in internal structure.

The figures of the complete Persian bow (Plate VI, Fig. 9), and the anatomy of another specimen (Figs. 10-16) are taken from specimens sent to the Oxford Museum, by Colonel Sir R. Murdoch Smith. The two specimens are exactly similar, so that the description of the structure of the one may be taken as applying to that of the other, which is figured entire.

These specimens are estimated by Colonel Murdoch Smith to be certainly 200 years old, and are very good examples of the highest type of composite bow. It is highly improbable that this weapon will ever improve, with the increasing use of fire-arms in Asia, and we are justified in regarding this as the culminating point in the series.

In shape this bow (Fig. 9) differs from the "Tatar" bow; the unstrung curve is more regular and resembles that of the Scythian bow as generally described, and the "ears," which are relatively much shorter, continue in the same curve with the

"arms"; they are moreover not bare, but overlaid with sinew as far as the nocks. The "arms" also, as compared with the "Tatar" bow, are proportionately flatter, wider at the centre, and more tapered towards the "ears" and "grip"; and they are further more markedly plano-convex in section. The specimen figured does not exhibit the recurving in the unstrung state, to the extent of many examples, in some of which the tips actually cross one another.

As the scale is ascended the tendency to conceal the structural details beneath an external coat, and thus to give an homogeneous appearance to the bow, becomes increased. We observe it in its infancy in the Siberian bows with their plain or very slightly ornamented bark covering, lying over the sinew backing; and higher in the scale this coating, which at first doubtless served a purely *useful* purpose, as a protection from the effects of weather, becomes more and more a vehicle for the embellishment of ornamental art, at the same time increasing in its extent, till the maximum is reached in bows of the Persian type, in which usually the elaborate structure is entirely concealed by a coat of lacquer, upon which frequently great artistic skill is lavished in floral designs and scroll work picked out in gold. All composite bows appear to require soaking in water to produce their maximum effect, and possibly this bark coat, besides protecting the sinews from injury, was intended primarily to prevent rapid change in the condition of the bow, and especially the sinew and glue, from changes in the temperature, and to protect them from the sun's rays. *Secondarily*, it was found to be a convenient ground upon which to lay the varnish and paint which give the finishing touches. I do not know the composition of the lacquer used, but it must doubtless be of a very special nature not to crack all over when the bow is bent.

The specimens figured are, as appears to be usually the case with the Persian bows, entirely covered with the lacquer coat, except at the edges of the arms, where the side strips of horn appear on the surface, as in most specimens where they occur at all.

A section (Fig. 10) taken transversely across the centre of one of the arms, at once exhibits a marked difference from the corresponding section in the Tatar bow (Fig. 4). It is seen that the centre (*a, a*) is composed of a light-coloured wood in two pieces, unequal in width, and the surface of this is much scored with rough grooves, to give a firm hold to the glue and sinews. The belly is composed of a number of narrow strips of horn (*b, b*) instead of a single piece. These are joined to the wood and to each other with glue, which is seen filling up the interstices as an hyaline substance (*h*). Over the horn strips is a very thin

layer of transversely disposed sinews mixed with glue, extending from side to side, and apparently to assist in keeping together the numerous strips. This does not occur in the "Tatar" bow. The back is covered with a thick layer (*c*) of longitudinal sinews, slightly mixed with glue, the layer being well coated on the outside with glue, the surface of which is smoothed and polished. The sinew layer appears to be single and not in two strata, as in the "Tatar" bow. Overlying *both* belly and back is a layer of the finest inner bark of the birch, very delicate, and applied in rhomboidal pieces, as before described (there is no layer of coarser bark), and immediately upon this lies the external coat of lacquer. At the edges the strips of horn (*d, d*) are exposed and break the seemingly spiral winding of the bark, which is only apparent, as the edges of the pieces on the back and belly do not correspond.

Fig. 11, Plate VI, is taken from a dissection of the belly side of this part, shewing the successive strata—the horn strips (*b, b*); the external side strips (*d, d*); the transverse sinews (*k*); the bark layer (*e, e*), shewing portions of two pieces; the external lacquer (*l*), which replaces the bark coat (*f*), of the "Tatar" bow. A dissection of the back is shown in Fig. 12, where *c* represents the sinew reinforcement, and *c*² the external surface of this, coated with smooth polished glue.

Fig. 13 shews a transverse section through the middle of the ridge at the commencement of the terminal "ear," corresponding to Fig. 6. The number of horn strips is smaller than at the centre of the arm, shewing that these do not all run the whole length of the arms; the horn ends abruptly at the commencement of the "ears," about three inches beyond the point at which this section is taken. It is also seen that in the Persian bow the wood base enters less into the formation of the ridge than is the case in the "Tatar" form; the ridge is here almost entirely moulded up from the sinew mass.

A transverse section (Fig. 14) through one of the "ears" shows the hardwood base split up into four pieces, *a, a, a, a*. The two smaller pieces commence at the point where the horn ends, and take its place. A new element appears in a flat piece of horn *m*, running down the centre, at right angles to the faces of the bow. This is a thin horn wedge, thickest at the extremity beyond the nock, to which it gives support. It resembles the similar piece in a Chinese bow in its use, but differs in its traversing the whole length of the "ear," and in never entirely forming the extreme tip beyond the nock. The longitudinal sinews, *e, e*, surrounding the "ear" are in continuation of the longitudinal backing sinews, which are here brought round in two bands, completely encasing the wood, being only separated

from each other by the edges of the thin horn wedge, which are seen externally. Below the nock is a band of transverse sinews, binding together the elements composing the "ear." There is no layer of bark over the "ears," the lacquer and gilt being applied directly to the sinew.

Fig. 15 is taken from a transverse section through the centre of the handle or grip, corresponding to Fig. 7: a^1 and a^2 are two pieces of hardwood forming the base, the smaller piece being inserted to pad out the grip and to give it a rounded form; the two are glued together. The number of horn strips which reach this point is reduced to four, as this portion is narrowed considerably. This section does not cut through the point of junction of the two sets of horn strips, for, as will be seen from Fig. 16, the meeting point is not exactly at the centre in this specimen. The sinew backing extends nearly round the grip, omitting only the portion where lie the horn strips, overlying which is a thin layer of transverse sinews, as elsewhere. The shape is partly moulded from the sinew mass, as it is in the ridges (Fig. 13). The bark covering entirely surrounds this part, as the side strips of horn do not extend along the grip.

In the longitudinal section through the grip (Fig. 16), is seen the extent of the small pad of hardwood, a^2 , and the meeting point of the two sets of horn strips, between the ends of which is inserted a thin strip of wood. The principal piece of wood in the grip, a^1 , continues in either direction a short distance along the arms in the form of a wedge, pushing its way between the pieces which form the centre of the arms, which are represented in Fig. 10, a , a .

In the figure of the perfect Persian bow the points at which the transverse sections have been cut are indicated with dotted lines.

Hansard in his "Book of Archery," quoting Thevenot, says, "Oriental bowyers use a peculiar kind of glue, made from a root called in Turkey 'Sherischoan,' which they grind like corn between two stones, until it resembles sawdust." It is certainly a most effective kind of glue, as it does not appear to crack with use, though it sets very firmly; it is also very pellucid.

Murdoch Smith¹ says of these bows that, after leaving the maker's hands, in order to be strung for use, they had first to be softened in a bath, and then gradually opened by cords attached to pegs in the ground.

Although the finer Indian bows are of a high type, they hardly attain to the level of the typical Persian bow, and many of them shew signs of a slight degeneration from a higher type. They are closely related to the Persian and Turkish types.

¹ "Persian Arts." South Kensington Museum Handbook.

The specimen of an Indian bow which I have dissected and figured (Figs. 17-21, Plate V) is very strongly recurved in the unstrung state; each arm for a third of its length is curved sharply at right angles to the rest, which is only slightly curved, thus forming a marked rounded elbow. It is rather less powerful than the Persian bow described, being less stoutly made and of weaker materials. In external appearance it shows a strong resemblance to the Persian bow; the ears are shorter and the shoulders more pronounced, these being very square. It is entirely covered externally with a thin lacquer coat, differing in appearance from that of most bows of this or the Persian types; this appears to be due to the fact of its lying not on bark, but on a peculiar metallic layer resembling tinfoil, but infinitesimally thin, and perhaps painted on from a solution. It gives a hard appearance to the overlying lacquer. There is no trace of side strips of horn along the edges of the arms. The nocks are not, in this specimen, strengthened with horn.

On examining the structural details by means of sections, many departures from the Persian type are observable.

To take a transverse section through the centre and broadest part of one of the arms (Fig. 17), it will be at once seen that the horn here plays a far less important part than in either the Persian or Tatar types. The belly is not entirely composed of this substance, as in the latter types. The wood centre (*a*) is composed of a single piece along the arms; this is deeply and neatly grooved longitudinally towards the belly, in order to give firm hold to the glue, which forms a fairly thick layer (*h*) between the wood and the horn. The horn (*b*) is composed of a single piece in each arm, and not composed of strips as in the Persian bow; its surface is grooved towards the wood. The horn does not extend to the edges, but is overlaid with a stratum of longitudinally disposed sinews, similar to those on the back, and apparently a continuation of them. The sinews are in a double layer; one layer, *n*¹, composed of sinews with little glue mixed with them, does not extend *over* the horn, but fills up the space between it and the edges; this is a continuation of the inner layer of the back, *c*¹. The outer layer, *n*², overlies both horn and inner sinew layer, *n*¹. The shape of the belly is thus to a great extent given by a padding out of sinews. The outer sinew layer, *n*², is mixed with glue or cement, and has a dull grey brown colour; this is coated with a kind of red brown cement, the surface of which is smoothed. Over this brown cement lies the peculiar thin metallic film, which is extremely delicate, and it is difficult to prevent its rubbing off when exposed. To this is applied the external ornamental lacquer coat. It is not easy to account for the substitution of the

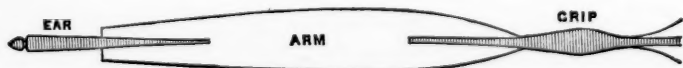
metallic layer for the bark one, as it seems to be but an indifferent vehicle for the lacquer, which flakes away from it rather easily. The external sinew layer of the back, c^2 , differs from that on the belly in being only slightly mixed with glue and having none of the grey brown cement.

Fig. 18 shows a dissection of the belly of this part, displaying the succession of the layers, a =the wood; h =the glue; b =the horn; n^2 , the outer sinews mixed with grey cement; o , the brown cement; l , the lacquer.

A dissection of the back is represented in Fig. 19; p is the metallic film.

Fig. 20 is taken from a transverse section through the centre of one of the ridges. The wood centre is seen here to be composed of three strips, a^1, a^2, a^3 , of which the centre piece, a^1 , enters largely into the formation of the ridge, and is a wedge-shaped continuation of the "ear," which fits between two divided ends of the single piece forming the arms. The extremities of these double ends form the shoulders. The horn has dwindled down to very small proportions, as it is thinned away as it approaches the shoulder, and adds but little support to this part. This reminds one of the "Tatar" bow, and shows divergence from the Persian types; but this specimen differs from both types in the belly at this point being chiefly built up of sinews and cement. Beyond the "shoulder" the "ear" is formed of a single piece of wood, but a layer of sinews encases it as far as the nocks. The actual tips are painted black, as though intended to represent horn.

A transverse section through the centre of the "grip" (Fig. 21), shows that the bulk of this portion is composed of a single piece of wood, a , the horn, however, playing a fairly important part. Round the whole lies the inner layer of sinews, here evidently perfectly continuous all round, c^1, n^1 ; and over this on the back the outer sinew layer, c^2 , and on the belly the layer of sinew and grey cement as before, the two different layers meeting at the sides and overlapping one another slightly. This double sinew casing is of an equal thickness all round, and the shape of the grip is formed by the wood and horn. The central piece of wood is continued wedge-like into the arms, tapering at either end and fitting into a V, formed by the divided end of the wood of the arms. Represented diagrammatically the wood-work of the whole is arranged thus; rather more than one half of the bow being represented.



The two strips of horn do not meet in the centre, but, as in the Persian bow above, a little away from this point.

The more prominent structural peculiarities of this type then, are:—(1) The small proportion of horn in its construction; (2) the presence of layers of longitudinal sinews on the belly, replacing to a great extent the horn; (3) structure of the wood base; (4) the absence of a layer of bark and the presence of cement and metallic coat; (5) the absence of side strips of horn.

It shows resemblance with the "Tatar" type in the sudden bend at the elbows; in the formation of the ridges chiefly from the wood centre; in the *single* strip of horn in each arm; in the *double* layer of backing sinews; in the thinness of the horn towards the "ears." It resembles the Persian type in the general moulding of the shape of the different parts; to a certain extent in the structure of the wood base; in the *entire* concealment of structure beneath an ornamental coat.

There is evidence that this form is, to a certain extent, a degenerate offshoot from a higher type, *e.g.*, the comparative weakness of the whole, and also the weakness of certain parts. This latter is indicated in very many examples by rough external bindings or splicings at the elbows and on either side of the grip, added in order to assist these parts to stand the severe strain. Sometimes these splicings have been added after the completion of the bow, as the lacquer coat has been first completed over these parts, and it seems as though the weapon had been discovered to be weak after use. In other cases it has been applied in the first instance, as a finishing touch; the lacquer having been omitted at the parts where the splicing was intended to be added. Fig. 22, taken from a specimen in the Pitt Rivers collection, shows one of these bows spliced in this fashion; it recalls the similar cross splicing at the elbows of most Western Esquimaux bows.

Another possible sign of degeneration is the absence of the side strips of horn along the edges. These, however, are frequently imitated by means of lines of black paint, thus indicating the desirability and former presence of the real material. Their absence is due to the continuation of the sinews round to the belly, thus leaving no edges to be concealed and finished off; but as this is so at the expense of the horn reinforcement, and so also of the strength of the weapon, it cannot be regarded as a mark of progress.

Again, the substitution of other materials for the bark layer as a vehicle for the ornamental lacquer does not, judging from this specimen, appear to be a success.

The Indian bows vary to a considerable extent in form and in external appearance, but, so far as I have been able to see

from superficial examination, the greater number do not differ materially in structure from the specimen described, which may be taken as fairly typical of the class. Many approach more nearly to the Persian type, and bark is often present beneath the lacquer.

I have not been able to examine a number of Turkish bows, but I gather that they are for the most part only slight modifications of the type of which the Persian and Indian bows are varieties.¹ A bow in the British Museum, described as Turkish, is small and very beautifully finished. Its length is 3 ft. 8½ in., and greatest width 1½ inches. The grip is covered with bark, and bulges towards the back only; the horn of the belly is exposed and polished, thus reminding one of the "Tatar" type; it is in two pieces, separated at the centre of the grip by a thin ivory plate. The sinew backing is covered with thin black leather, upon which designs are picked out in gold. The ridges are strongly marked, and the "ears" of plain wood and very short, partly covered on the back with birch bark. The nocks are lined with leather. In transverse section the arms are plano-convex. It is very powerful for its size; the reflex curve is very regular and increased gradually towards the "ears," resembling the curve of most Persian bows. Of the internal structure I am unable to speak.

I have confined myself in the above remarks to the class of weapons which goes by the name of the "composite bow," that is, bows which have a reinforcement of sinews on the back, and which in many cases exhibit further a composite structure, in the presence of a variety of materials. There are, however, a few forms which, although they must be excluded from this class, nevertheless show a relationship to the composite type, and give evidence that they have been derived from it.

Many plain wood bows from the Oregon Indians have a strong reflex curve when unstrung, though this is not due to the presence of sinews on the back, the curve being *carved* to shape in the wood itself. They are very flat, short, and springy, and in general character suggest relationship to bows of composite nature. Besides these, most of the bows of the Clapet tribe show a similar relationship. These again are plain or "self" bows, but in their strongly plano-convex or concavo-convex section seem to point to the aforesaid origin. They are moreover characterized by having broad grooves along the back, which may be considered as possibly imitating a former sinew backing, or even as being channels along which a sinew cord

¹ "The composite bow was held in great esteem with the Arabs and Turks, in whose language are many words for different bows, the parts of them, and the discharging of them." Anuchin, *op. cit.*

used formerly to lie, though now disused and merely retained from force of habit.

In Java we find a bow which is peculiar to the island. It is composed of two arms each consisting of a single piece of horn, usually of black buffalo horn, meeting at the centre, where they are fixed into a large rounded wooden handle, composed of two pieces, joined at top and bottom with a metal ferule. The horn is plain and smooth, in section plano-convex; in the unstrung state there is a strong reflex curve; the nocks are deep and the extremities laterally flattened, and there are ridges below the nocks. From these characters it would seem as though the Javanese bowyers had originally had the Asiatic composite bow in view. This being so, one can understand that the material (horn), which alone is exposed to view in the Asiatic model, suggested the use of that substance for the construction of the whole. Raffles, in his history of Java, tells us that these bows ("Gendewa") are seldom used in modern days, except on state occasions. Perhaps I may be allowed here to digress a little in order to mention a somewhat interesting fact which lately came under my notice. Dr. Hickson, on his return from the Malay Archipelago, showed me, amongst other specimens, a bow which had been obtained from New Guinea. This, however, proved to be a perfectly characteristic Javan bow, such as I have described, which had somehow found its way eastward to a region where its proper use was not appreciated. The strongly recurved outline of the bow, when unstrung, does not appear to have suggested its *raison d'être* to the mind of the savage into whose hands the weapon fell, as he adapted the bow to his own use by adding a bow-string of rattan, ingeniously fixed on the wrong side. He thus made the *reflex* curve that of the strung bow, and in this way contrived to minimize the power of the weapon. Moreover the shape of the nocks is not adapted for a flat rattan string, which in this case does not present its flat surface towards the bow, as in all New Guinea bows, but edgewise, in a highly ineffective position. This serves perhaps to emphasize the intimate connection between this reversed curve and composite structure, and to strengthen the idea that the Oregon bows, above mentioned, are copied from composite bows. It is unusual to find a recurved outline in, so to speak, "pure bred" self bows of savage races.

Another kind of bow, which shows a relationship to the "composite bow," is that described as formerly in use in Lapland. This weapon has entirely vanished in these parts, and was apparently obsolete at the time of Linnaeus' visit in 1732; it has succumbed entirely before the inroad of fire arms, although these are for the most part of very primitive type; most

of the rifles that I saw among the Lapps during a short visit last summer to East Finmarken, were modern reproductions of the antiquated "snaphaunce." I cannot do better than reproduce the description given by Jean Scheffer¹ of these bows; he says, "La première arme et la plus en usage sont les ares, qui sont long d'environ trois aunes, larges de deux doights, épais de la grosseur du pouce ou d'un peu plus, faits de deux bâtons, qu'ils attachent l'un sur l'autre. Car ils mettent sur un bâton de Bouleau un autre bâton de Pin, qui par l'abondance de la resine est doux et facile à plier, afin que ses qualités donnent à l'arc la force de pousser bien loin les dards et les flèches; et ils les couvrent tous deux d'écorce de Bouleau, pour les conserver contre les injures de l'air, des néges, et de la pluie, . . . j'ajoute qu'elles sont collées ensemble avec une espee de glu. Les Lapons preparent et font ainsi cette glu. Ils prennent des poissons que l'on nomme perches, dont ils ostent la peau, etant encore fraichement peschées, ils les tiennent dans de l'eau chaude, jusqu' à ce qu'on les puisse netteier de toutes leurs écailles, puis ils les font cuire dans un peu d'eau, et ont soin de les écumer, de les remuer souvent, de les battre avec un petit bâton, et de les consumer jusqu' à ce qu'elles ne ressemblent plus estre que du bouillon; ils rependent cette liqueur épaisse en un lieu où elle se durcit, et la conservent pour le besoin, et quand il faut coller quelque chose, ils la font dissoudre dans un peu d'eau. . . ." This bow is composite to the extent of being composed of two kinds of wood, but no sinew reinforcements seems to have been added, and this weapon must be regarded as a variety of the plain bow, though showing the influence of the proximity of bows of strictly "composite" type to a very considerable extent. It is said that the Lapp bow resembled in shape the "Tatar" form, and Scheffer's figure bears out this statement; the presence, moreover, of a covering of birch bark betrays a connection with the more easterly types. The bark in this bow, as in the Siberian bows, appears to have served a purely useful purpose, without being used as a vehicle for embellishment. General Pitt Rivers mentions that these bows were held horizontally, in shooting, like those of the Esquimaux.²

The practice of combining two kinds of wood, *i.e.* forming "backed" as opposed to "self" bows, became very popular in

¹ "Histoire de la Laponie," traduite du Latin de Jean Scheffer. 1678.

² Anuchin mentions both fish glue and stag's (reindeer) glue as used in making these bows, which are sometimes as much as six feet long. He also says that they are commonly still met with amongst the Voguls. Later he says, "The Finn bows in all probability were composite, as now amongst the Voguls and Ostiaks."

England, when introduced from France, and has continued to the present day. Usually a thin strip of ash, elm, or hickory was glued upon the back of a yew bow, when the best quality of the latter wood was not obtainable. Occasionally the two pieces were ingeniously united together by a groove and dovetail throughout their length. These bows must, however, be regarded as varieties of the "arcus" or plain bow, and not related to the "composite" bow.

Steel bows have been made in imitation of composite bows of Asiatic origin. Anuchin says, "Composite bows from the Greeks spread to Italy in the XV and XVI centuries, where their form was imitated in bows made of steel, as also in India and other Eastern parts."

One more kind of bow deserves mention, as particularly interesting from the locality in which it is found. W. M. Moseley, in his "Essay on Archery," says, "The Otaheite bows are very long, and consist of one piece only, on the back part of which there is a groove containing a pretty thick cord. The cord reaches the whole length, and is fastened very strongly at each end. This contrivance is found very serviceable in assisting the strength of the bow, and acts in some measure as a spring." He also compares this to the sinew backing of the Esquimaux. I have never seen a specimen of a South Pacific bow reinforced with a cord in this way, but this passage seems to offer a far more rational explanation of the groove, which forms so characteristic a feature in the bows from the Tongan group, than that given by Captain Cook,¹ who says of them, "On the inside is the groove in which is put the arrow, from which it would seem that they use but one." Very likely this may have been a *secondary* use of the groove; Cook in fact figures an arrow *in situ*, but then this could hardly have been sufficiently desirable to have *given rise* to the groove. The ends of most Tongan bows are carved to form slightly raised channels, whose hollows are in continuation with the groove along the backs of the bows, see Fig. 23; the outer ends of these raised channels form the shoulders upon which the bow-string rests when the bow is strung. The form of these channels, and their continuation into a groove along the back of the bow, is very suggestive of their having been intended for a cord to lie along, the groove being necessary in order to prevent the cord slipping away when the bow was bent. The cord could have been wound round the shoulders in the same way as the bow-string. The groove along the back varies very much in depth in different specimens, in some being deep enough to contain an arrow, while in others it is very slightly marked indeed and incapable

¹ "Cook's Voyage, 1772-75," Vol. i, p. 221, and plate.

of serving a useful purpose. Possibly, in the case of these latter, when the cord reinforcement went out of use, and the deep groove became no longer necessary, the latter was still from force of habit carved along the back, though far less deeply, in some specimens being a mere narrow indented line; the raised channels in some specimens no longer exist. I do not know of any Otaheitan bows which have grooves, or which appear to be intended to be used with a "backing" cord, but it is possible that the bows which Moseley described as from Otaheite were really bows of this Tongan form, and perhaps from that group of islands. This form of reinforcement must have been independently evolved in the South Pacific, as the only other races using a "free" backing are restricted to North America and the easternmost parts of North Asia. The case should therefore be regarded as one of analogy rather than of homology. Bows from Guiana and Peru frequently have a groove or furrow running along the back, often fairly deep, and the Chunchos of Peru are said to insert a spare arrow into the groove and hold it there with the bow hand. There is no evidence, so far as I know, of a cord reinforcement being used in South America (though it is common to see bows with a spare bow-string fastened to them). This may appear to go against my remarks in the case of the Tongan bows, as we have in South America bows in which a groove is used solely for the insertion of an arrow, with no record of its having been otherwise used; but I think that nevertheless the fact of there being specimens of reinforced bows on record from the South Pacific, coupled with the very specialized form of the groove in many of the Tongan bows, gives support to my suggestion.¹

In seeking for the original home and birth-place of the composite bow, the mass of evidence seems to refer us to some part of North Central Asia,² possibly the more northerly regions of the ancient Scythia, where the absence of wood suited to the making of "plain" bows created the necessity of employing a combination of heterogeneous materials, in the attempt to imitate the bows of other people. There is strong evidence, as General Pitt Rivers points out, that this scarcity of proper wood extended further to the southward in prehistoric times than is the case now.

¹ The custom of holding arrows in the *bow* hand when shooting, is common to several races, *e.g.*, South America, Ancient Mexico, amongst the Negritos. This is also seen in representations of archers on ancient Greek and Etruscan vases, as also of Norman archers on the Bayeux tapestry. *Vide* Anuchin, *op. cit.*

² Anuchin (*op. cit.*) says, "Taking into consideration the wide spread of the composite bow in North and Central Asia, and in Eastern Europe, we are led to think that it was invented somewhere within the limits of that region, and spread itself thence from a single centre over the East into North America, and over the West."

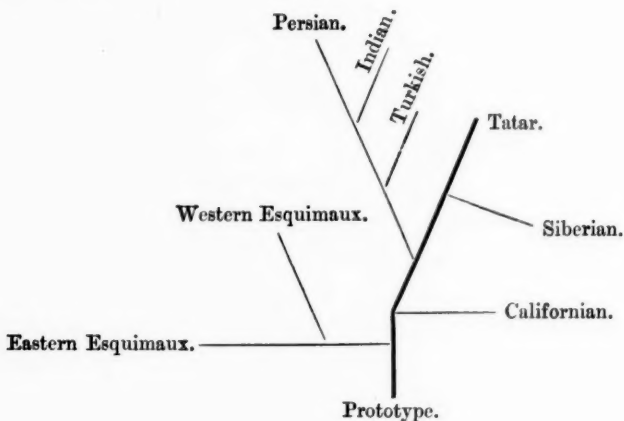
It is impossible to say whether the "free" backed bows, of which those of the Esquimaux are survivals, were really the earliest, and that this was the most primitive method used in reinforcing the bows. This kind, if it ever existed there, has entirely disappeared in Central Asia; but when we consider that all northerly races, from Lapland across Asia and America to Greenland, employ the sinews of animals constantly in the form of twisted thread or plaited cords for a variety of purposes; whereas *moulded* masses of sinews are, to say the least, but rarely employed, we can see that there is great probability that the earliest way in which sinews were employed for backing bows, was in the form of twisted or plaited cords rather than of masses. If this be so we must consider that the introduction of the bow amongst the Esquimaux took place at a remote period, and that these have existed in this state to the present day, chiefly on account of the isolation of these parts; though in the westerly regions the bows of the Esquimaux shew that they have been influenced, in shape at least, by the proximity to the Asiatic continent, and that for the same reason, as well as because of the access to better materials, these bows have been greatly improved and altered from the primitive type, which to a certain extent is represented by the Eastern Esquimaux examples.

Its spread from the place of origin to other parts of the world, gave in some cases a new weapon to nations which could never have used the earlier "self" bow, whereas in other cases its introduction amongst fresh races must have been subsequent to its having reached some degree of perfection, as it ousted the "self" bow then in use, and became recognized as a superior weapon. Thus by its spread in a northerly and easterly direction, across the Behring Sea, the Esquimaux became possessed of a weapon hitherto unknown to them; and so also in the case of Siberia, where it is very improbable that the natives made use of a plain wood bow. When introduced by the Mongols into China it supplanted the "plain" bow, which already existed there. General Pitt Rivers mentions that the "kung" bow was not the original bow of the country, but was introduced by the Tatars. It spread into India from the north, and here again the indigenous "long" bow has given way before its composite rival, and only the uncivilized aborigines of the north retain the use of the former, though it has held its own in South India and Ceylon.

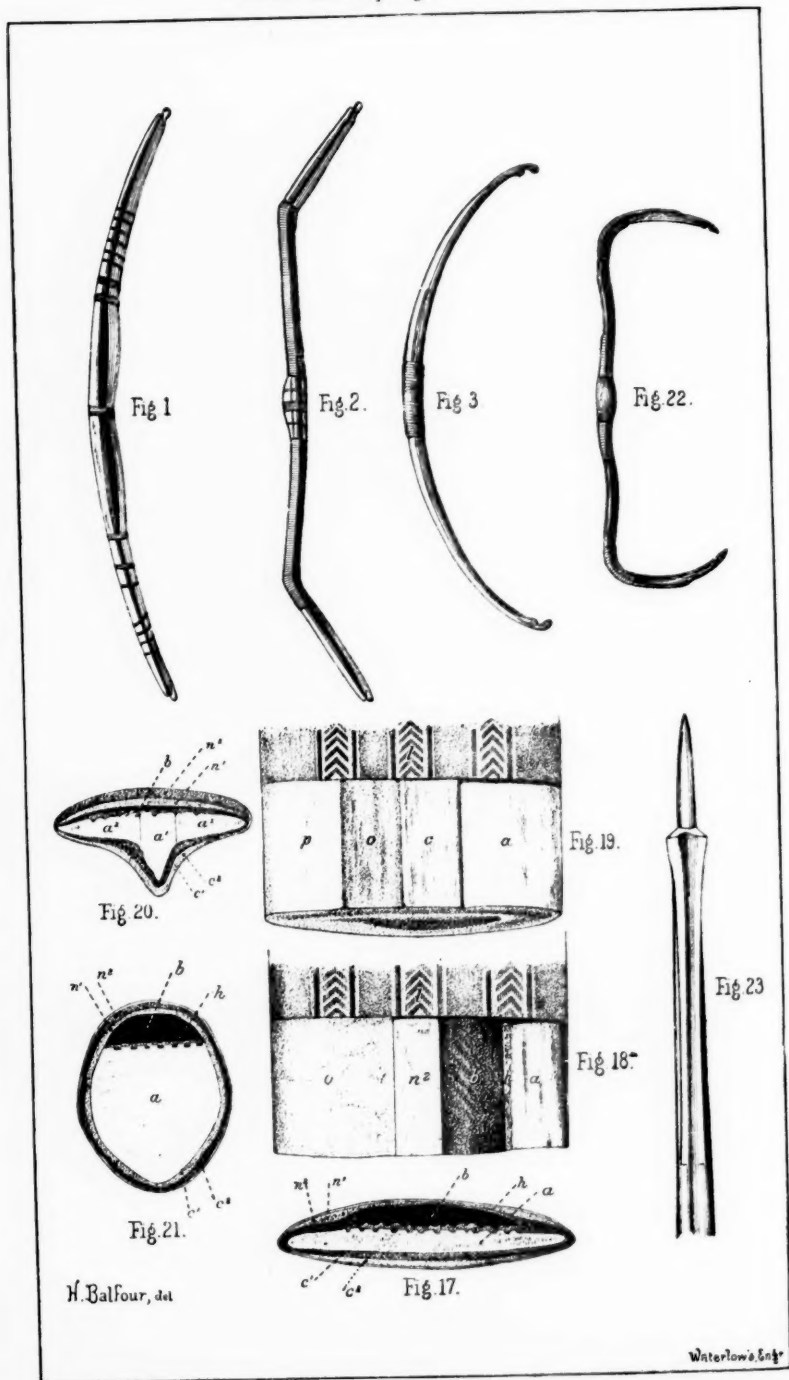
We know that the Persians owe this weapon to the Scythians, as Herodotus tells us that Cyaxares, King of the Medes, and great grandfather of Cyrus, among other important military reforms, adopted the bow as a military weapon, having learnt the use of it during his wars with the Massagetae, Scythians,

and other races. He even kept certain Scythian archers to teach his son Astyages to shoot. Cyaxares died B.C. 594, but the bow remained in use and became a national weapon, and a figure of it a national emblem. Persian bows remained celebrated to the eighteenth century.

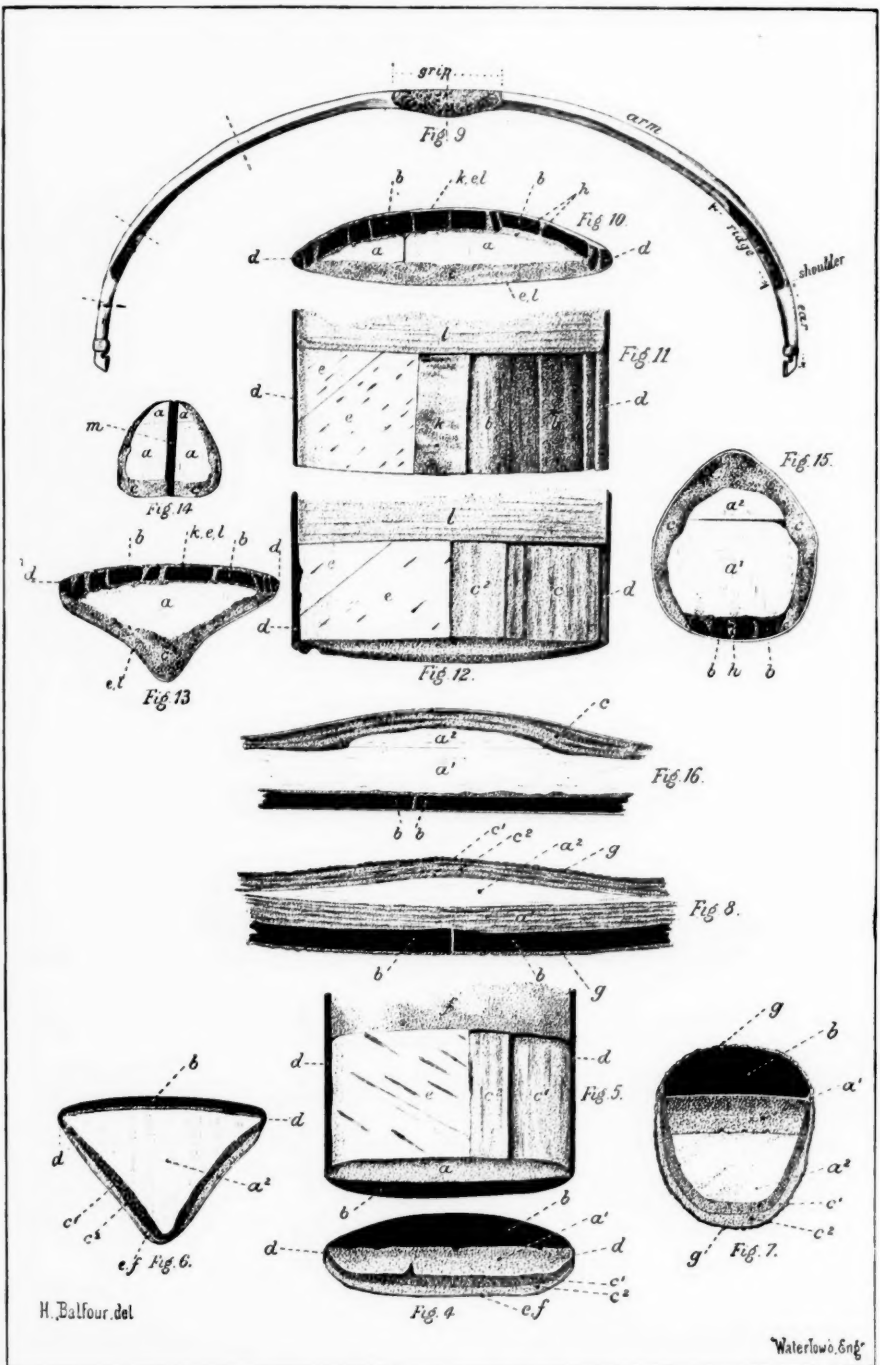
It is not easy to represent the probable affinities of the different existing varieties of the composite bow in the form of a genealogical tree, but I give here a rough scheme, which seems to me to illustrate broadly the lines of connection of the leading modern types.



I have aimed in my paper at giving an account of the comparative anatomy of the composite bow, in order to illustrate the structure and affinities of the chief varieties. I regret that I have had so little material at my command, as the dissection of a larger number of varieties would no doubt contribute largely towards establishing the lines of connection between the types and their modes of derivation from earlier forms. Without the assistance of a "geological record" and "embryological" evidence, which so materially assist the animal and vegetable morphologist, in tracing the history of such an object as the composite bow, the anthropological comparative anatomist is obliged to be content with observations made upon the "recent" and "adult" weapon, and thus the number of his clues is considerably limited.



STRUCTURE OF THE COMPOSITE BOW.



H. Balfour. del

Waterlow, Eng'

Description of Plates V. and VI.

Fig. 1. Bow with simple form of "free" sinew backing; Eastern Esquimaux. Obtained by Capt. Lyon. Ashmolean Museum collection.

Fig. 2. Bow with more advanced type of "free" sinew backing, and shewing the "Tatar" outline. Western Esquimaux, near Icy Cape. Obtained by Capt. Beechey. Ashmolean Museum collection.

Fig. 3. Bow with simple form of "close" sinew backing, California. Obtained by Capt. Belcher. Pitt-Rivers collection.

Figs. 4-8. Chinese bow of "Tatar" shape.

Fig. 4. Transverse section through the centre of one of the "arms."

Fig. 5. Dissection of the back at the same part.

Fig. 6. Transverse section through the centre of one of the "ridges."

Fig. 7. Transverse section through the centre of the "grip."

Fig. 8. Longitudinal section through the "grip."

a¹. Wood base extending along "arms" and "grip."

a². Hardwood forming the "ears" and "ridges," and inserted as a plug to pad out the grip.

b. Horn, a single piece to each arm.

c¹. Inner layer of backing sinews.

c². Outer " " "

d. Side strips of horn.

e. Layer of fine inner bark of the birch.

f. Coarser outer bark.

g. Coarse transverse sinews round the grip.

Fig. 9. Persian bow, dotted lines indicate the points at which transverse sections have been taken in the following specimen.

Figs. 10-16. Persian Bow.

Fig. 10. Transverse section through centre of one of the arms.

Fig. 11. Dissection of the belly at the same part.

Fig. 12. Dissection of the back at the same part.

Fig. 13. Transverse section through the centre of one of the ridges.

Fig. 14. Transverse section through one of the "ears."

Fig. 15. Transverse section through the centre of the grip.

Fig. 16. Longitudinal section through the grip.

a. Hardwood base.

a². Plug of hardwood inserted into "grip."

b. Strips of horn.

- c.* Sinew backing.
- d.* Side strips of horn.
- e.* Layer of very fine inner bark of birch.
- h.* Glue.
- k.* Transverse sinews over the horn on the belly.
- l.* Lacquer coat.
- m.* Piece of horn, supporting the "ears" and "nocks."

Figs. 17-21. Indian Bow.

- Fig. 17. Transverse section through the centre of one of the arms.
- Fig. 18. Dissection of the belly at the same part.
- Fig. 19. Dissection of the back at the same part.
- Fig. 20. Transverse section through the centre of one of the ridges.
- Fig. 21. Transverse section through the centre of the "grip."
- a.* Hardwood base.
 - b.* Horn, a single piece in each "arm."
 - c*¹ and *c*². Inner and outer layers of sinews on the back.
 - h.* Glue.
 - l.* External lacquer coat.
 - n*¹. Layer of longitudinal sinews on the belly.
 - n*². Layer of grey brown cement-like substance, mixed with sinews.
 - o.* Red brown cement coating.
 - p.* Metallic film upon which the lacquer lies.
- Fig. 22. Indian bow, probably from the Punjâb, shewing supplementary transverse splicing of sinews at the "elbows" and on either side of the "grip." Pitt-Rivers collection.
- Fig. 23. One end of a plain wood bow from the Tongan Group, shewing the raised channel and part of the groove. Pitt-Rivers collection.

DISCUSSION.

General PITT-RIVERS spoke upon the subject of the paper, and has since forwarded the following remarks:—

Mr. Balfour's paper has been sent to me for my remarks, but I regret that having since been engaged in a tour of Inspection of Ancient Monuments for the Government, I have not had time to do more than read it over cursorily. It appears to have been much modified since it was read before the Institute.

The subject of the distribution of the bow formed part of the developmental series of objects which I presented to the University of Oxford in 1884, and as Mr. Balfour has been charged with the superintendence of my collection since the lamented illness of Professor Moseley, he has had an opportunity of studying the

collection and of accumulating additional evidence about the specimens contained in it. The bow occupied fifteen pages of my descriptive catalogue of the weapon department of my museum, which went through two editions in the hands of the South Kensington Authorities, before the collection was presented to Oxford, and of these, six pages were devoted to the class of bow to which I gave the name of "composite" in order to distinguish it from the plain bow.

The general idea that I endeavoured to give expression to in connection with the composite bow was, that it probably originated through necessity in a region in which suitable elastic woods for the plain bow were not to be procured; because it is used exclusively in the north, in which part of the world such woods do not, or in early times, probably did not grow in great profusion; because it is quite unknown in southern and tropical regions where such woods do grow habitually, and also because there is distinct evidence that in India and China the use of the composite bow came in from the north.

Supposing that this class of bow was adopted through necessity, from the absence of proper wood for making a plain bow, and that it was of very early origin, then, as we know that in times following the Drift period, the cold region, in which nothing but drift wood could be obtained, extended much further south than is the case at present; and we have also evidence that the Esquimaux in some places now adopt this form of bow because they can get no better, and that people resembling the Esquimaux in their arts and implements are known to have inhabited as far south as the French caves, the same cause may have led to its adoption in early times further south in the world and in places where no necessity for such a makeshift exists at the present time.

The perishable materials of which the composite bow is composed make it impossible to trace its history by means of ancient specimens. In the case of bronze and stone implements we are enabled to arrange them with some certainty in the order in which they were invented or introduced, but in the case of objects so subject to decay as the bow, and especially the composite bow, it is only by means of survivals that we can form any conjecture as to the order in which they arose; and this is always an uncertain process, because degeneration of form is as prevalent in all the arts of life as improvement. In nearly all arts it is possible to obtain and arrange specimens so as to represent continuous stages of perfection or imperfection arising as much from carelessness in manufacture, want of intelligence, or the absence of suitable materials on the one hand, as from the exercise of inventive genius, increased skill, or increased facility for obtaining better materials or more perfect tools on the other hand. No certain clue can be arrived at as to whether the several objects are to be regarded as successive links in an ascending or a descending scale.

The hypothesis I put forward provisionally with respect to the

composite bow, and which Mr. Balfour appears to have adopted, was, that the Esquimaux bow, consisting of separate pieces put together with rivets, strengthened and rendered elastic either by means of numerous strands of sinews tied on at the back, or of sinews formed into a stout cord and bound on upon the convex side, represented the survival of the earliest form of the composite bow, which primeval man, in the absence of a better class of weapon, was compelled to form in order to serve his purpose as a bow. That the bows in which, like those of the Californian Indians and other tribes of the north-west coast of America, the sinew instead of being formed into a strong cord or numerous small strands at the back, is spread over the back in thin layers and glued on to it, represent an improved form which all must have gone through before they developed into the more advanced form of Tatar, Indian, Persian, and Chinese bows, in which the sinews or other elastic materials besides being spread over and glued to the back, are bound up and covered over with bark or some other suitable substance, so as to give it the appearance of a single piece like the plain bow. I also showed that the connection between the Chinese bow and the bow of the Western Esquimaux is rendered certain by the adoption in both, of the curved back straight pieces at the ends, which Mr. Balfour terms "ears," united to the body of the bow, at an angle or elbow, the particular use of which is not very clear, though its influence on the flight of the arrow may be conjectured. The probability of its being a form of some special use is made more likely by the fact of its having been adopted in India with the steel bow, made entirely of one piece of that metal, and consequently not a necessary adjunct of any composite construction of the weapon; unless indeed it was adopted in the steel bow through sheer unreasoning conservatism, like so many survivals in the material arts. I think, however, that this form may have a tendency to draw the bow-string taut in the direction of its length during the release, and thereby possibly to increase the initial velocity of the arrow.

But there is another point connected with the origin of this class of bow into which Mr. Balfour has not entered. He has given detailed descriptions of some varieties in the construction of the composite bow, but he has not said anything about the advantages which the different changes and additions were destined to achieve; yet each variety must either have been intended as an improvement, or must have been introduced through some unknown conditions affecting the craft of the bowyer. If we could get at these we should be in a better position to appreciate the causes of the variations and the spread of the different varieties. In my catalogue I endeavoured to collect a few facts relating to the performances of these two classes of bow in respect of range and accuracy. It is not an easy matter to obtain reliable information on the subject, for the users of the long bow have never been proverbial for the accuracy of their statements concerning it. In the early part of my professional career as Chief Instructor of

Musketry, I had considerable experience in the methods of testing the range and accuracy of missile weapons, and I am well aware how much care would be required for such an investigation. Yet the information is not altogether inaccessible, and from what I was able to gather, the composite bow does not appear to be a superior, but, if anything, an inferior weapon to the plain bow, when made of the proper wood and in skilful hands. We know how tenaciously the soldiers of our own country clung to the long bow for some time after the first introduction of fire-arms, and how many works were published in praise of it at that time. But this has an important bearing on the origin of the composite bow, which, being of more complex structure, must certainly be of later introduction. No one would have originated the idea of piecing together several bits of hard unbendable material, and giving them elasticity by means of sinews or hide, unless they had previously been acquainted with the use of the plain bow. It must either have been done through necessity or by way of improvement, and upon this depends the question whether it was introduced in a primitive or an advanced stage of the arts. If the composite bow has any material advantages over the plain bow, then there is no occasion to bring in necessity as the cause of its origin. It may have been intended to give increased initial velocity or greater range or momentum to the arrow; it may have been a means of producing equal power with a reduced length of bow thereby adapting it better to be used on horseback, and it may have been regarded in its day as a triumph of mechanical ingenuity, in which case the Western Esquimaux bow with its stout cord at the back, and the Eastern Esquimaux bow with its numerous strands of sinews bound on behind, the North West Coast bow with its adhesive backing, and the various descriptions of Asiatic bows which Mr. Balfour has introduced into his paper, may be degenerate copies of the more perfect weapon. Perhaps the observation of Sir Edward Belcher that the Esquimaux in their construction of this bow, appeared always to have the Tatar form in view, and the observed fact that the nearer the American tribes to the Asiatic continent, the closer their bow resembles the Tatar form, may be taken as an argument in favour of this view. But if, on the other hand, it can be shown that the composite bow, even in its most perfect form, never exceeded or equalled the plain bow in its performances, it is evident that no one would have taken the trouble to construct the more complicated bow with its numerous contributory processes, when they could have obtained a more powerful weapon by simply employing a bent stick. On this hypothesis it would be reasonable to regard necessity rather than improvement as the cause of its introduction, and to assume that it may probably have come into being lower down in the scale of civilization and at an earlier period in the history of the world's inventions, and the various forms now in use in different parts of the world may represent successive stages of improvement rather than downward steps in the decline of the art. In this, as in all

the arts, the various stages, whether of improvement or decline, co-exist in different places at the same time. They are like geological formations cropping out on the surface: like different species of animals representing different stages of development occupying different areas at the same time; or like the dialects and families of languages co-existing and showing affinities for each other, yet not derived from one another, but from earlier and perhaps undiscoverable originals. But it is evident that the bow cannot be studied apart from its performances, and that the causes as well as the results of the variations will have to be taken into consideration, if we are ever to have an exhaustive treatise on the bow, similar to that which Sir Richard Burton has written for the sword.

My own contribution to the subject was nothing more than an introduction to the study of the bow contained within the limits of a descriptive catalogue, and included as part of a series of other developments which my museum was collected to throw light upon. The museum contained eighty-two specimens of bows, of which twenty-two were composite bows, and the number was somewhat increased before the collection was presented to the University. But the amount of illustration in my catalogue was limited by the South Kensington Authorities, by whom it was published, and was totally inadequate to display the collection properly. Mr. Balfour has gone into much greater detail, and although he has not, I think, extended the known area of distribution of the several varieties, he has contributed materially to a more thorough knowledge of their construction. It is also satisfactory to me to find that his researches have done nothing to discredit the views that I at first held, but have rather confirmed them, and I trust he will be encouraged to take up hereafter an original subject of his own, for nearly all the arts of life are capable of the same developmental treatment, and the field that is open for the curator of a museum of evolution, such as I have endeavoured to establish at Oxford, is almost unlimited. In a museum so designed and arranged, no halting place is possible: it must itself develop as the series of objects contained in it have developed; new series will have to be introduced, and old series must be extended, modified, and the superfluous objects tending to confuse the sequence of their development must be eliminated. Other museums will have to be established containing other series suitable to the localities in which they are situated, for no single museum can possibly contain specimens illustrating the continuous growth of all the arts and contrivances of mankind.

ANTHROPOLOGICAL MISCELLANEA.

RACE AND LANGUAGE.

I have read with much interest Colonel Campbell's note on the above subject (*Journal Anth. Inst.*, Vol. xix, p. 89). But with regard to my own note on the matter (Vol. xviii, p. 439), I fail to see in what way I have "misunderstood the Duke of Argyll, or the Duke Captain Burt."

The passage quoted by Colonel Campbell from "Burt's Letters" seems to me to show that the Duke's statement that, "so late as about 1730-35 it was difficult to get domestic servants from Fifeshire who could speak English" is practically borne out by Burt's remarks. My own object was to call attention to the fact that in a county like Fife, occupying towards Edinburgh a position similar to that of Essex towards London, a Celtic language was spoken later than in Cornwall—the people of Cornwall being admitted to be mainly of Celtic race, while Fifeshire is commonly supposed to be almost as "Saxon" as Berwickshire, and the Lothians. This makes the case of Fife much more noteworthy than that of any part of the old Kingdom of Strathclyde (the population of which has always been allowed to be largely Celtic and pre-Celtic by descent), though it is interesting to learn from Colonel Campbell that there is evidence that "Gaelic was spoken in Galloway till about the middle of the 18th century."

I have long felt with Colonel Campbell that "we must recognise that change of speech, or even change of sovereignty, implies no change of race." The subject of Race and Language, indeed, suggests so much in the way of remark and illustration as to be quite beyond the scope of a brief note. So I will only add that it seems to me that while a record that English was the language of the great mass of the people of Fife 400 or 500 years ago, would by no means necessarily imply the destruction, or driving out, of the greater part of a pre-existing Celtic-speaking race, the fact that a Celtic tongue was the language of the mass of the people there a century and-a-half ago is strong evidence of the mainly Celtic origin of the present English-speaking inhabitants of Fife.

T. V. HOLMES.

NAGA ORNAMENTS.

In the "Journal of the Anthropological Institute" for November, 1885, there appeared a plate of Akka ornaments entitled, "Objects from the Akkas, Northern Assam." It struck me that these were not Akka objects, but were really Naga ornaments, and so I wrote to a friend of mine in Assam, Mr. Penny, who accompanied me into the Daphla Hills in 1884, and I enclose his remarks. I should state that when I received the Journal in question I was in Gilgit, whence we crossed the Hindu Kush into Wathán and Badakshán. Our postal arrangements were uncertain, and when I received Mr. Penny's answer we were on the march. I had hardly returned from the Oxus trip when I started for Upper Burma, where my explorations lasted nine months. Thus Mr. Penny's letter was laid aside and overlooked. In going through some old correspondence I came across it again lately, and on the ground that it is "better late than never" to correct false impressions, I am addressing you now.

Mr. Penny says:—"The ornaments are Naga. I have never seen dyed hair used by any of the tribes on the North Bank in any way. The *dha* (knife) is also different from any I have seen on this side of the river. I have never seen shells used as ornaments either. None of the ornaments nor the *dha* came from this side of the river."

From my knowledge of the Nagas, I should say the shells were the Angami neck ornaments. They are worn on the back of the neck, lying flat between the shoulders, and are peculiar to the Angamis. The basket is common to many Naga tribes. Mr. Penny has lived for more than twenty years on the north bank of the Brahmaputra, and has an extensive acquaintance with the hill tribes on that bank.

R. T. WOODTHORPE.

12